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REPORT

OF THE

TESTS OF METALS

AND

OTHER MATERIALS

FOR

INDUSTRIAL PURPOSES

MADE WITH THE

UNITED STATES TESTING MACHINE AT WATERTOWN ARSENAL,
MASSACHUSETTS,

DURING

THE FISCAL YEAR ENDED JUNE 30, 1887.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1889.

A. 1043

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A report from the Chief of Ordnance of "Tests of iron and steel and other materials for industrial purposes," at Watertown Arsenal, for the fiscal year ending June 30, 1887.

DECEMBER 13, 1887.—Laid on the table and ordered to be printed.

WAR DEPARTMENT,
Washington City, December 5, 1887.

The Secretary of War has the honor to transmit to Congress a letter of the 29th ultimo, from the Chief of Ordnance, U. S. Army, and its accompanying report of "Tests of iron and steel and other materials for industrial purposes," made with the United States testing machine, at Watertown Arsenal, during the fiscal year ended June 30, 1887.

The Chief of Ordnance concurs in the recommendations of the commandant of the arsenal that a smaller machine should be procured to test minor specimens, in order to relieve the large machine from such work and confine its use to the testing of full-sized members of structures, for which it was specially designed; and that a larger edition of these annual reports should be printed, in order that the results of the tests might be given a wider circulation.

The views of the Chief of Ordnance are concurred in by this Department.

WM. C. ENDICOTT,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

WATERTOWN ARSENAL,
Watertown, Mass., August 31, 1887.

SIR: I have the honor to submit herewith the report of tests made at this arsenal during the fiscal year ending June 30, 1887, on the strength of structural material.

There were tested during the year a total of 1,398 specimens, of which number 1,135 were public and 263 private tests. Many of the public tests were for the Government service, the remainder being experimental investigation of building material in different shapes and under varying conditions. Only the public tests are given in this report. Private tests, the cost of which is paid by the citizen for whom the tests are made, are regarded as confidential.

The table of contents gives the nature and subject of the public tests made, and a list of parties for whom private tests were made is appended.

The number of tests made during this year is less than that of previous years. Fewer Government tests were presented, and while that gave more time for private tests, that fact not being known, many persons who might have been glad to avail themselves of the opportunity probably refrained from sending their specimens under the belief that time for such work was as limited as it had been in previous years. The whole number of private tests exceeded very slightly that of the preceding year.

Although the number of tests is not great, the list embraces some of exceptional interest.

Some of the more interesting and valuable are the temperature tests continued from last year; investigation of the initial strains occasioned by tempering and annealing gun tubes and cylinders; the frictional resistance due to shrinkage of gun cylinders; slow and rapid tests of wrought-iron bars; tests of cast-iron columns; modulus of elasticity of stone; and resistance in the bore of gun to a 3″.2 banded projectile.

My previous recommendations for another smaller testing machine upon which to test smaller specimens is renewed; also for a more liberal distribution of the annual reports of testing work. There can be no wisdom in the Government expending $10,000 a year in making industrial tests if the results are not made known generally to those interested, to whom they would be of benefit, and for whom they are ostensibly made.

The receipts and expenditures for the year were as follows:

TESTING MACHINE, 1887.

Amount appropriated for testing machine and testing work	$10,000.00
Amount received during the fiscal year from private tests	807.65
	10,807.65
Expended for services and labor	7,755.92
Expended for steam-power, tools, implements, repairs, and improvements	2,563.97
Deposited to credit of Treasurer of the United States	487.76
	10,807.65

Very respectfully, your obedient servant,

F. H. PARKER,
Lieut. Col. Ord. Dept., U. S. A., Commanding.

The CHIEF OF ORDNANCE U. S. A.,
Washington, D. C.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, D. C., November 29, 1887.

SIR: I have the honor to submit, for transmission to Congress, as required by law, the report of Lieut. Col. F. H. Parker, Ordnance Department, commanding Watertown Arsenal, of "Tests of iron and steel and other materials for industrial purposes," made with the United States testing machine, during the fiscal year ending June 30, 1887.

Some of the tests reported are of exceptional interest, and especially in the line of gun construction.

The recommendation for a smaller machine is renewed, as is also the printing of a larger edition, that such valuable results may have a wider circulation.

Very respectfully, your obedient servant,

S. V. BENÉT,
Brig. Gen., Chief of Ordnance.

The SECRETARY OF WAR.

REPORT OF TESTS

ON THE

STRENGTH OF STRUCTURAL MATERIAL

MADE AT THE

WATERTOWN ARSENAL, MASS.,

DURING THE

FISCAL YEAR ENDED JUNE 30, 1887.

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INSTRUCTIONS FOR MARKING TEST SPECIMENS.

The significance of the marks on the gun specimens is explained by the following:

ORDNANCE OFFICE, *March* 1, 1886.

I. *Specimens from forgings and castings.*

Test specimens taken from metal to be used in ordnance construction (excepting those taken from billets for wire drawing) will be marked on both ends to show—

(1) The caliber of the gun for which the metal is intended: 32 for 3.2-inch; 8 for 8-inch; 10 for 10-inch; 12 for 12-inch, etc.

(2) The kind of gun for which the metal is intended: R for steel rifle; Mr for mortar; W R for wire wound rifle; C I R for cast-iron rifle; C N R for converted rifle, etc.

(3) The number of the gun of the particular kind: 1, 2, 3, etc.

(4) The part of the gun for which the metal is intended: T for tube; J for jacket, etc. In the case of cast-iron guns, or cast-iron bodies for guns combined of steel and cast-iron, where the specimens are ordinarily taken from the initial tension rings, the abbreviation will be T R, showing that the specimen is from the initial tension ring, and if more than one initial tension ring is taken from either end the abbreviations T R_2, T R_3, etc., will be used.

(5) The end of the piece of metal from which the specimen is taken: B for breech; M for muzzle.

(6) The direction in which the specimen is taken: T for tangential, or those taken parallel to a tangent at the circumference; L for longitudinal, or those taken parallel to the axis of the gun; R for those taken radially.

(7) The number of the specimen: 1, 2, 3, etc. The same series of numbers to be used for each end (breech or muzzle) of the piece of metal.

(8) The position with reference to the interior and exterior surfaces of the piece of metal: I for inside specimens, or those taken near the interior surface; O for outside specimens, or those taken near the exterior surface; M for middle specimens, or those taken midway between the interior and exterior surfaces.

(9) The fact that the specimen has been laid off and stamped in the presence of the inspector or his assistant, and that its identity is vouched for: this is indicated by the inspector's private stamp—the escutcheon of the Ordnance Department, one-quarter of an inch in diameter, on hardened steel.

These marks will appear in the order indicated; those required to indicate the points numbered 1, 2, 3, and 4 (which show from what the specimen is taken) being in one line, the remainder (which show how the specimen is taken) being in a second line just below the first, as seen when looking at the end of the specimen. The marks and the inspector's private stamp should always be on the specimen from the time it is laid off until finished, and before they are effaced in one place by any finishing operation must be transferred to some other place in the presence of the inspector or his assistant.

The ring, slice, or piece which is to furnish test specimens, and the forging or casting from which it is to be cut, will each be marked before the cut is taken, and close to the cut, to indicate the points numbered 1, 2, 3, 4, 5, and 9.

LIST OF ABBREVIATIONS.

32	3.2-inch.	B R	Base ring.
5	5-inch.	K R	Key ring.
8	8-inch.	G R	Gas-check ring.
10	10-inch.	M C	Muzzle collar.
12	12-inch.	B C	Breech cup.
R	Steel rifle.	Bu	Bushing.
Mr	Mortar.	Sh	Shell.
C I R	Cast-iron rifle.	St	Shot.
C N R	Converted rifle.	T R	Initial tension ring.
B	Breech.	T	Tangential.
M	Muzzle.	L	Longitudinal.
T	Tube.	R	Radial.
J	Jacket.	I	Inside.
T H	Trunnion hoop.	O	Outside.
B B	Breech block.	M	Middle.
Sp	Spindle.	A_1, A_2, A_3, A_x, etc	A hoops.
O S	Obturator stem.	B_1, B_2, B_3, B_x, etc	B hoops.
L	Lever.	C_1, C_2, C_3, C_x, etc	C hoops.
S	Sleeve.	D_1, D_2, D_3, D_x, etc	D hoops, etc.

The actual marks on the ends of the specimens, the nature of the piece of metal, and the name of the manufacturer should appear in the proper place on the blank forms used in sending specimens to any point for test, and in reporting to the Chief of Ordnance that they have been sent for test.

A sketch showing the positions of the specimens in the piece from which they are taken will always be furnished the officer charged with making the tests.

Uniformity in the order of numbering specimens from similar pieces of metal will be observed as far as possible.

EXAMPLES OF MARKING.

$\left.\begin{matrix} 8\ R_2\ T \\ B\ T_4\ I \end{matrix}\right\}$ Specimen from tube for 8-inch steel rifle, No. 2. Taken from the breech end, tangentially, near the interior surface. Fourth specimen taken from that end.

$\left.\begin{matrix} 8\ R_2\ J \\ M\ R_8 \end{matrix}\right\}$ Specimen from jacket for 8-inch steel rifle No. 2. Taken from the muzzle end, radially. Eighth specimen taken from that end.

$\left.\begin{matrix} 8\ R_2\ T\ H \\ T_1\ M \end{matrix}\right\}$ Specimen from trunnion hoop for 8-inch steel rifle No. 2. Taken tangentially, midway between interior and exterior surfaces. First specimen taken from the hoop.

$\left.\begin{matrix} 10\ R_1\ A_7 \\ T_3\ O \end{matrix}\right\}$ Specimen from hoop A_7 for 10-inch steel rifle No. 1. Taken tangentially from near the exterior surface. Third specimen taken from the hoop.

$\left.\begin{matrix} 12\ C\ I\ R_1\ T\ R \\ M\ T_{12}\ M \end{matrix}\right\}$ Specimen from initial tension ring of 12-inch cast-iron rifle No 1. Taken from the muzzle initial tension ring, tangentially, midway between interior and exterior surfaces. Twelfth specimen taken from the muzzle ring.

$\left.\begin{matrix} 32\ R_8\ O\ S \\ L_1 \end{matrix}\right\}$ Specimen from obturator stem for 3.2-inch steel rifle No. 8. Taken longitudinally. First specimen taken from the piece.

$\left.\begin{matrix} 12\ C\ I\ R_1\ B\ B \\ T_2\ O \end{matrix}\right\}$ Specimen from breech block for 12-inch cast-iron rifle No. 1. Taken tangentially near the exterior surface. Second specimen taken from the piece.

II. *Specimens from billets for wire drawing.*

As a lot of billets for wire drawing may furnish wire for several guns, test specimens taken from such billets will be marked to show—

(1) The number of the lot of billets; indicated by Nos. 1, 2, etc.

(2) The fact that the specimen is from a wire billet; indicated by W.

(3) The number of the ingot in the lot; indicated by Nos. 1, 2, 3, 4, etc.

(4) The end of the ingot from which the specimen was taken; indicated by U for upper end, and B for bottom end. (The top and bottom billets of an ingot are generally the only ones tested, and specimens are taken from the upper end of the top billet and from the bottom end of the bottom billet.)

(5) The direction in which the specimen is taken; indicated by L for longitudinal, T for transverse.

(6) The number of the specimen; indicated by Nos. 1, 2, 3, etc. A series of numbers to be used for each ingot.

(7) The fact that the specimen has been laid off and stamped in the presence of the inspector or his assistant and that its identity is vouched for; indicated by the inspector's private stamp.

These marks will appear in the order indicated; those required to indicate the points numbered 1, 2, and 3 (which show from what the specimen is taken), being in one line; the remainder (which show how the specimen is taken), being in a second line just below the first as seen when looking at the end of the specimen.

EXAMPLES OF MARKING.

1 W 78 U L_1	Specimen from wire billet of ingot No. 78 of lot No. 1. Taken from upper end of top billet, longitudinally. First specimen so taken.
2 W 20 B T_2	Specimen from wire billet of ingot No. 20 of lot No. 2. Taken from bottom end of bottom billet, transversely. Second specimen so taken.

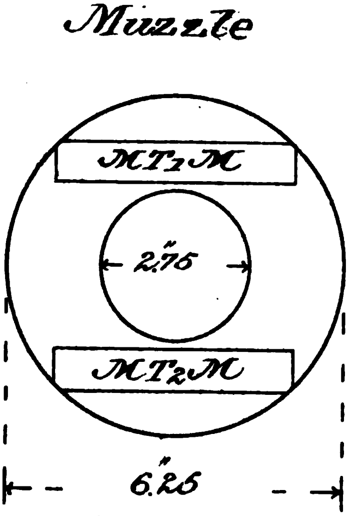
S. V. BENÉT,
Brigadier-General, Chief of Ordinance.

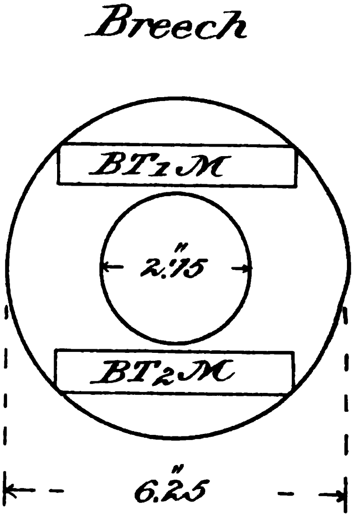
3.2-INCH STEEL B. L. RIFLES.

STEEL SPECIMENS FROM TUBES, JACKETS, TRUNNION HOOPS, SLEEVES, BREECH BLOCKS, BASE RINGS, KEY RINGS, BLOCK CARRIERS, GAS-CHECK CUPS, AND SPINDLES.

3.2 inch steel B.L. Rifles

Tubes


Muzzle

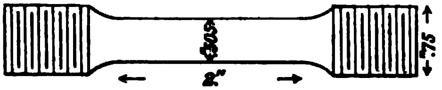

Breech

TESTS OF STRENGTH OF STRUCTURAL MATERIAL.

3.2-INCH STEEL B. L. RIFLES.

DETAILS OF TESTS.

Form of specimens.



No. 3466.

Marks, $\frac{32\,R_{29}\,T}{B\,T_1\,M}$

Diameter, ".505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001550	0.	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001800	.000100	....	....	Elastic limit.
10,400	52,000	.005600	.003800	....	....	
10,600	53,000	.007100	.001500	....	....	
10,800	54,000	.008000	.000900	....	....	
11,000	55,000	.008750	.000750	....	....	
11,200	56,000	.009600	.000850	....	....	
11,400	57,000	.010600	.001000	....	....	
11,600	58,000	.011750	.001150	....	....	
11,800	59,000	.012500	.001750	....	....	
12,000	60,000	.013400	.000900	....	....	
12,400	62,000	.015500	.002100	....	....	
12,800	64,000	.017900	.002400	....	....	
13,200	66,000	.020000	.002100	....	....	
13,600	68,000	.022500	.002500	....	....	
14,000	70,000	.025100	.002600	....	....	
14,400	72,000	.027600	.002500	....	....	
14,800	74,000	.030350	.002750	....	....	
15,200	76,000	.033750	.003400	....	....	
15,600	78,000	.037550	.003800	....	....	
16,000	80,000	.041900	.004350	....	....	
16,400	82,000	.047500	.005600	....	....	
16,800	84,000	.053250	.005750	....	....	
17,200	86,000	.0600	.006750	....	....	
17,600	88,000	.0675	.0075	....	....	
18,000	90,000	.0900	.0225	....	....	
18,330	91,650	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91,650
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2450
Elongation per inch under strain at elastic limit	do ...	.001800
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		48.8
Position of rupture		".55 from neck
Character of broken surface		silky
Elongation of inch sections		".15, ".34*

No. 3467.

Marks, $\frac{32\ \text{Res}\ T}{B\ T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	.0	.0	Initial load.
1,000	5,000	.000100	.000100	.0	....	
2,000	10,000	.000250	.000150	.0	....	
3,000	15,000	.000350	.000100	.0	....	
4,000	20,000	.000500	.000150	.0	....	
5,000	25,000	.000700	.000200	.0	....	
6,000	30,000	.000900	.000200	.0	....	
7,000	35,000	.001050	.000150	.0	....	
8,000	40,000	.001250	.000200	.0	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	Elastic limit.
10,000	50,000	.001800	.000150	....	....	
10,200	51,000	.003600	.001800	....	....	
10,400	52,000	.007400	.003800	....	....	
10,600	53,000	.008000	.000600	....	....	
10,800	54,000	.008600	.000600	....	....	
11,000	55,000	.009500	.000900	....	....	
11,200	56,000	.010350	.000850	....	....	
11,400	57,000	.011400	.001050	....	....	
11,600	58,000	.012100	.000700	....	....	
11,800	59,000	.013050	.000950	....	....	
12,000	60,000	.013900	.000850	....	....	
12,400	62,000	.015900	.002000	....	....	
12,800	64,000	.018200	.002300	....	....	
13,200	66,000	.020350	.002150	....	....	
13,600	68,000	.022650	.002300	....	....	
14,000	70,000	.025350	.002700	....	....	
14,400	72,000	.028100	.002750	....	....	
14,800	74,000	.031250	.003150	....	....	
15,200	76,000	.034500	.003250	....	....	
15,600	78,000	.038500	.004000	....	....	
16,000	80,000	.043400	.004900	....	....	
16,400	82,000	.049000	.005600	....	....	
16,800	84,000	.056250	.007250	....	....	
17,200	86,000	.063900	.007650	....	....	
17,600	88,000	.0800	.0161	....	....	
18,000	90,000	.0950	.0150	....	....	
18,170	90,850	.1350	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	90,850
Elastic limit per square inch of original section	do	49,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.50 from neck
Character of broken surface		silky
Elongation of inch sections		″.15, ″.33

No. 3468.

Marks, $\genfrac{}{}{0pt}{}{32\,R_{20}\,T}{M\,T_1\,M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000450	.000200	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000750	.000150	0.	....	
6, 000	30, 000	.000900	.000150	0.	....	
7, 000	35, 000	.001150	.000250	0.	....	
8, 000	40, 000	.001250	.000100	0.	....	
9, 000	45, 000	.001400	.000150	....	....	
9, 200	46, 000	.001450	.000050	....	....	
9, 400	47, 000	.001500	.000050	....	....	
9, 600	48, 000	.001500	0.	....	....	
9, 800	49, 000	.001550	.000050	....	....	
10, 000	50, 000	.001600	.000050	....	....	
10, 200	51, 000	.001700	.000100	....	....	Elastic limit.
10, 400	52, 000	.001850	.000150	....	....	
10, 600	53, 000	.002300	.000450	....	....	
10, 800	54, 000	.003000	.000700	....	....	
11, 000	55, 000	.003950	.000950	....	....	
11, 200	56, 000	.005250	.001300	....	....	
11, 400	57, 000	.006400	.001150	....	....	
11, 600	58, 000	.007400	.001000	....	....	
11, 800	59, 000	.008350	.000950	....	....	
12, 000	60, 000	.009350	.001000	....	....	
12, 400	62, 000	.011000	.001650	....	....	
12, 800	64, 000	.012550	.001550	....	....	
13, 200	66, 000	.014750	.002200	....	....	
13, 600	68, 000	.016850	.002100	....	....	
14, 000	70, 000	.018800	.001950	....	....	
14, 400	72, 000	.021150	.002350	....	....	
14, 800	74, 000	.023750	.002600	....	....	
15, 200	76, 000	.026250	.002500	....	....	
15, 600	78, 000	.029300	.003050	....	....	
16, 000	80, 000	.032650	.003350	....	....	
16, 400	82, 000	.036400	.003750	....	....	
16, 800	84, 000	.040600	.004200	....	....	
17, 200	86, 000	.046000	.005400	....	....	
17, 600	88, 000	.051750	.005750	....	....	
18, 000	90, 000	.0610	.009250	....	....	
18, 400	92, 000	.0700	.0090	....	....	
18, 800	94, 000	.1000	.0300	....	....	
18, 890	94, 450	.1300	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	94, 450
Elastic limit per square inch of original section	do....	51, 000
Elongation per inch after rupture	inch..	0. 2400
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		43. 8
Position of rupture		". 75 from neck
Character of broken surface		silky
Elongation of inch sections		".15, ".33

No. 3469.

Marks, $\begin{matrix}82 & R_{29} & T\\ M & T, & M\end{matrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000700	.000250	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001650	.000100	....	....	
9,600	48,000	.001700	.000050	....	....	
9,800	49,000	.001750	.000050	....	....	
10,000	50,000	.001800	.000050	....	....	Elastic limit.
10,200	51,000	.002100	.000300	....	....	
10,400	52,000	.002900	.000700	....	....	
10,600	53,000	.003900	.001000	....	....	
10,800	54,000	.005000	.001100	....	....	
11,000	55,000	.006100	.001100	....	....	
11,200	56,000	.007100	.001000	....	....	
11,400	57,000	.008150	.001050	....	....	
11,600	58,000	.009100	.000950	....	....	
11,800	59,000	.010000	.000900	....	....	
12,000	60,000	.011000	.001000	....	....	
12,400	62,000	.012500	.001500	....	....	
12,800	64,000	.014100	.001600	....	....	
13,200	66,000	.016000	.001900	....	....	
13,600	68,000	.018100	.002100	....	....	
14,000	70,000	.020200	.002100	....	....	
14,400	72,000	.022750	.002550	....	....	
14,800	74,000	.025850	.003100	....	....	
15,200	76,000	.028500	.002650	....	....	
15,600	78,000	.031100	.002600	....	....	
16,000	80,000	.034250	.003150	....	....	
16,400	82,000	.038700	.004450	....	....	
16,800	84,000	.043250	.004550	....	....	
17,200	86,000	.048500	.005250	....	....	
17,600	88,000	.055500	.007000	....	....	
18,000	90,000	.064750	.009250	....	....	
18,400	92,000	.0850	.010250	....	....	
18,750	93,750	.1300	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds..	93,750
Elastic limit per square inch of original section..........do....	50,000
Elongation per inch after rupture..........inch..	0.02450
Elongation per inch under strain at elastic limit..........do....	.00180
Reduction in diameter at point of rupture..........do....	.125
Reduction in area after rupture, per centum of original section..........	43.3
Position of rupture..........	″.85 from neck
Character of broken surface..........	silky
Elongation of inch sections..........	″.33*, ″.16

No. 3451.

Marks, $\overset{32\ R_{s}\ T}{B\ T_1\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001500	.000250	....	....	
10,000	50,000	.001650	.000150	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001700	0.	....	....	Elastic limit.
10,600	53,000	.001850	.000150	....	....	
10,800	54,000	.002600	.000750	....	....	
11,000	55,000	.004550	.001950	....	....	
11,200	56,000	.006400	.001850	....	....	
11,400	57,000	.007600	.001200	....	....	
11,600	58,000	.008650	.001050	....	....	
11,800	59,000	.009350	.000700	....	....	
12,000	60,000	.010000	.000650	....	....	
12,400	62,000	.012000	.002000	....	....	
12,800	64,000	.014150	.002150	....	....	
13,200	66,000	.017000	.002850	....	....	
13,600	68,000	.019000	.002000	....	....	
14,000	70,000	.021500	.002500	....	....	
14,400	72,000	.023750	.002250	....	....	
14,800	74,000	.026250	.002500	....	....	
15,200	76,000	.029000	.002750	....	....	
15,600	78,000	.032000	.003000	....	....	
16,000	80,000	.035600	.003600	....	....	
16,400	82,000	.040000	.004400	....	....	
16,800	84,000	.045000	.005000	....	....	
17,200	86,000	.051500	.006500	....	....	
17,600	88,000	.059750	.008250	....	....	
18,000	90,000	.0675	.007750	....	....	
18,400	92,000	.0950	.0275	....	....	
18,600	93,000	.1250	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93,000
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.185
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".75 from neck
Character of broken surface		silky
Elongation of inch sections		".11, ".31*

No. 3452.

Marks, $\substack{\text{32 R}_a\text{ T} \\ \text{B T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.009250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001600	.000150	....	....	Elastic limit.
10,200	51,000	.002500	.000900	....	....	
10,400	52,000	.003750	.001250	....	....	
10,600	53,000	.005000	.001250	....	....	
10,800	54,000	.006500	.001500	....	....	
11,000	55,000	.007400	.000900	....	....	
11,200	56,000	.008250	.000850	....	....	
11,400	57,000	.009250	.001000	....	....	
11,600	58,000	.010150	.000900	....	....	
11,800	59,000	.011100	.000950	....	....	
12,000	60,000	.012000	.000900	....	....	
12,400	62,000	.013600	.001600	....	....	
12,800	64,000	.016000	.002400	....	....	
13,200	66,000	.018350	.002350	....	....	
13,600	68,000	.020350	.002000	....	....	
14,000	70,000	.022500	.002150	....	....	
14,400	72,000	.025200	.002700	....	....	
14,800	74,000	.028100	.002900	....	....	
15,200	76,000	.031050	.002950	....	....	
15,600	78,000	.034850	.003800	....	....	
16,000	80,000	.038750	.003900	....	....	
16,400	82,000	.043350	.004600	....	....	
16,800	84,000	.050000	.006650	....	....	
17,200	86,000	.056250	.006250	....	....	
17,600	88,000	.0650	.008750	....	....	
18,000	90,000	.0850	.0200	....	....	
18,400	92,000	.1200	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	92,000
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.2300
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.13 ″.33

No. 3453.

Marks, $\frac{32\ R_{22}\ T}{M\ T,\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000250	.000100	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	Elastic limit.
9,200	46,000	.001600	.000150	....	....	
9,400	47,000	.001950	.000350	....	....	
9,600	48,000	.002700	.000750	....	....	
9,800	49,000	.003550	.000850	....	....	
10,000	50,000	.005050	.001500	....	....	
10,200	51,000	.006300	.001250	....	....	
10,400	52,000	.007400	.001100	....	....	
10,600	53,000	.008400	.001000	....	....	
10,800	54,000	.009400	.001000	....	....	
11,000	55,000	.010250	.000850	....	....	
11,200	56,000	.011250	.001000	....	....	
11,600	58,000	.013500	.002250	....	....	
12,000	60,000	.015550	.002050	....	....	
12,400	62,000	.018050	.002500	....	....	
12,800	64,000	.020250	.002200	....	....	
13,200	66,000	.022550	.002300	....	....	
13,600	68,000	.024900	.002350	....	....	
14,000	70,000	.028150	.002250	....	....	
14,400	72,000	.032100	.003950	....	....	
14,800	74,000	.035250	.003150	....	....	
15,200	76,000	.039000	.003750	....	....	
15,600	78,000	.044000	.005000	....	....	
16,000	80,000	.051250	.007250	....	....	
16,400	82,000	.058000	.006750	....	....	
16,800	84,000	.0650	.0070	....	....	
17,200	86,000	.0850	.0200	....	....	
17,510	87,550	.1350	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	87,550
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.2350
Elongation per inch under strain at elastic limit	do....	.001450
Reduction in diameter at point of rupture	do....	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		".45 from neck
Character of broken surface		silky; opened crack in surface of stem
Elongation of inch sections		".34*, ".13

No. 3454.

Marks, $\genfrac{}{}{0pt}{}{\text{32 Rsa T}}{\text{M T}_2\text{ M}}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
9,200	46,000	.001450	.000050	....	....	
9,400	47,000	.001500	.000050	....	....	Elastic limit.
9,600	48,000	.001800	.000300	....	....	
9,800	49,000	.003250	.001450	....	....	
10,000	50,000	.004500	.001250	....	....	
10,200	51,000	.005500	.001000	....	....	
10,400	52,000	.006400	.000900	....	....	
10,600	53,000	.007700	.001300	....	....	
10,800	54,000	.008800	.001100	....	....	
11,200	56,000	.010200	.001400	....	....	
11,600	58,000	.012250	.002050	....	....	
12,000	60,000	.014750	.002500	....	....	
12,400	62,000	.017000	.002250	....	....	
12,800	64,000	.019000	.002000	....	....	
13,200	66,000	.021850	.002850	....	....	
13,600	68,000	.024500	.002650	....	....	
14,000	70,000	.027800	.003300	....	....	
14,400	72,000	.030350	.002550	....	....	
14,800	74,000	.033400	.003050	....	....	
15,200	76,000	.037750	.004350	....	....	
15,600	78,000	.042800	.005050	....	....	
16,000	80,000	.048500	.005700	....	....	
16,400	82,000	.056750	.008250	....	....	
16,800	84,000	.0650	.008250	....	....	
17,200	86,000	.0900	.0250	....	....	
17,510	87,550	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	87,550
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.2350
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.70 from neck
Character of broken surface		silky
Elongation of inch sections		″.11, ″.36

No. 3480.

Marks, $^{32\,\text{R}_\text{a}\,\text{T}}_{\text{B}\,\text{T}_1\,\text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
10,000	50,000	.001700	.000200	....	....	
10,200	51,000	.001800	.000100	....	....	Elastic limit.
10,400	52,000	.004000	.002200	....	....	
10,600	53,000	.006850	.002850	....	....	
10,800	54,000	.007900	.001050	....	....	
11,000	55,000	.009000	.001100	....	....	
11,200	56,000	.009750	.000750	....	....	
11,400	57,000	.010850	.001100	....	....	
11,600	58,000	.011850	.001000	....	....	
11,800	59,000	.012850	.001000	....	....	
12,000	60,000	.013800	.000950	....	....	
12,400	62,000	.016050	.002250	....	....	
12,800	64,000	.018250	.002200	....	....	
13,200	66,000	.021000	.002750	....	....	
13,600	68,000	.023550	.002550	....	....	
14,000	70,000	.026500	.002950	....	....	
14,400	72,000	.030150	.003650	....	....	
14,800	74,000	.033650	.003500	....	....	
15,200	76,000	.037750	.004100	....	....	
15,600	78,000	.042650	.004900	....	....	
16,000	80,000	.049000	.006350	....	....	
16,400	82,000	.057500	.008500	....	....	
16,800	84,000	.0650	.0075	....	....	
17,200	86,000	.0850	.0200	....	....	
17,510	87,550	.1300	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	87,550
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2250
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		″.24*, ″.21*

No. 3481.

Marks, $^{32\ \mathrm{R.\ T}}_{\mathrm{B\ T.\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000700	.000150	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001550	.000200	....	....	
10,000	50,000	.001750	.000200	....	....	Elastic limit.
10,200	51,000	.002000	.000250	....	....	
10,400	52,000	.002750	.000750	....	....	
10,600	53,000	.004000	.001250	....	....	
10,800	54,000	.006500	.002500	....	....	
11,000	55,000	.008000	.001500	....	....	
11,200	56,000	.009000	.001000	....	....	
11,400	57,000	.010000	.001000	....	....	
11,600	58,000	.011050	.001050	....	....	
11,800	59,000	.012000	.000950	....	....	
12,000	60,000	.013000	.001000	....	....	
12,400	62,000	.015200	.002200	....	....	
12,800	64,000	.017500	.002300	....	....	
13,200	66,000	.020000	.002500	....	....	
13,600	68,000	.022500	.002500	....	....	
14,000	70,000	.025500	.003000	....	....	
14,400	72,000	.029000	.003500	....	....	
14,800	74,000	.032250	.003250	....	....	
15,200	76,000	.035850	.003600	....	....	
15,600	78,000	.040600	.004750	....	....	
16,000	80,000	.046250	.005650	....	....	
16,400	82,000	.053000	.006750	....	....	
16,800	84,000	.063250	.010250	....	....	
17,200	86,000	.0700	.006750	....	....	
17,600	88,000	.1050	.0350	....	....	
17,690	88,450	.1350	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	88,450
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2350
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.90 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.35*

No. 3482.

Marks, $\frac{82\ R_{38}\ T}{M\ T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001400	.000200	.000050	.000050	
9,000	45,000	.001550	.000150	....	....	
9,200	46,000	.001600	.000050	....	....	
9,400	47,000	.001650	.000050	....	....	
9,600	48,000	.001700	.000050	....	....	Elastic limit.
9,800	49,000	.001950	.000250	....	....	
10,000	50,000	.008500	.006550	....	....	
10,200	51,000	.009100	.000800	....	....	
10,400	52,000	.010000	.000900	....	....	
10,600	53,000	.010850	.000850	....	....	
10,800	54,000	.011800	.000950	....	....	
11,000	55,000	.012650	.000850	....	....	
11,200	56,000	.013650	.001000	....	....	
11,400	57,000	.014750	.001100	....	....	
11,600	58,000	.016000	.001250	....	....	
11,800	59,000	.017050	.001050	....	....	
12,000	60,000	.018250	.001200	....	....	
12,400	62,000	.020750	.002500	....	....	
12,800	64,000	.023150	.002400	....	....	
13,200	66,000	.026250	.003100	....	....	
13,600	68,000	.029550	.003300	....	....	
14,000	70,000	.032750	.003200	....	....	
14,400	72,000	.037000	.004250	....	....	
14,800	74,000	.041500	.004500	....	....	
15,200	76,000	.047000	.005500	....	....	
15,600	78,000	.053250	.006250	....	....	
16,000	80,000	.062900	.009650	....	....	
16,400	82,000	.0750	.0121	....	....	
16,800	84,000	.0950	.0200	....	....	
17,200	86,000	.1400	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	86,000
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.2550
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.35*, ″.16

No. 3483.

Marks, $\substack{82\ \text{R}_{\text{ss}}\ \text{T} \\ \text{M T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	Elastic limit.
9,600	48,000	.003400	.001850	....	....	
9,800	49,000	.005500	.002100	....	....	
10,000	50,000	.006750	.001250	....	....	
10,200	51,000	.007500	.000750	....	....	
10,400	52,000	.008350	.000850	....	....	
10,600	53,000	.009250	.000900	....	....	
10,800	54,000	.010250	.001000	....	....	
11,000	55,000	.011500	.001250	....	....	
11,200	56,000	.012400	.000900	....	....	
11,400	57,000	.013500	.001100	....	....	
11,600	58,000	.014500	.001000	....	....	
11,800	59,000	.015400	.000900	....	....	
12,000	60,000	.016600	.001200	....	....	
12,400	62,000	.018750	.002150	....	....	
12,800	64,000	.021500	.002750	....	....	
13,200	66,000	.024150	.002650	....	....	
13,600	68,000	.027050	.002900	....	....	
14,000	70,000	.030350	.003300	....	....	
14,400	72,000	.034000	.003650	....	....	
14,800	74,000	.038750	.004750	....	....	
15,200	76,000	.043750	.005000	....	....	
15,600	78,000	.049000	.005250	....	....	
16,000	80,000	.055750	.006750	....	....	
16,400	82,000	.065750	.010000	....	....	
16,800	84,000	.0850	.019250	....	....	
17,200	86,000	.1050	.0200	....	....	
17,340	86,700	.1450	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	86,700
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.2700
Elongation per inch under strain at elastic limit	do	.001550
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.19, ″.35

No. 3349.

Marks, $^{32\ \mathrm{R_8\ T}}_{\mathrm{B\ T_1\ M}}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000350	.000100	.000050	.000050	
4,000	20,000	.000500	.000150	.000050	0.	
5,000	25,000	.000700	.000200	.000050	0.	
6,000	30,000	.000900	.000200	.000050	0.	
7,000	35,000	.001050	.000150	.000100	.000050	
8,000	40,000	.001200	.000150	.000100	0.	
9,000	45,000	.001400	.000200	....	....	
10,000	50,000	.001600	.000200	....	....	Elastic limit.
10,200	51,000	.003250	.001650	....	....	
10,400	52,000	.004300	.001050	....	....	
10,600	53,000	.006100	.001800	....	....	
10,800	54,000	.007550	.001450	....	....	
11,000	55,000	.008750	.001200	....	....	
11,200	56,000	.010000	.001250	....	....	
11,400	57,000	.011150	.001150	....	....	
11,600	58,000	.012300	.001150	....	....	
11,800	59,000	.013500	.001200	....	....	
12,000	60,000	.014650	.001150	....	....	
12,400	62,000	.016600	.001950	....	....	
12,800	64,000	.019250	.002650	....	....	
13,200	66,000	.022000	.002750	....	....	
13,600	68,000	.025000	.003000	....	....	
14,000	70,000	.028350	.003350	....	....	
14,400	72,000	.032650	.004300	....	....	
14,800	74,000	.036800	.004150	....	....	
15,200	76,000	.041800	.005000	....	....	
15,600	78,000	.046750	.004950	....	....	
16,000	80,000	.054300	.007550	....	....	
16,400	82,000	.0600	.0057	....	....	
16,800	84,000	.0800	.0200	....	....	
17,200	86,000	.1100	.0300	....	....	
17,500	87,500	.1400	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	87,500
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2300
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.13 ″.33

No. 3350.

Marks, $\frac{32\ R_e\ T}{B\ T_2\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000350	.000200	0.	....	
3, 000	15, 000	.000500	.000150	0.	....	
4, 000	20, 000	.000650	.000150	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001350	.000200	0.	....	
9, 000	45, 000	.001550	.000200	....	....	
9, 200	46, 000	.001600	.000050	....	....	
9, 400	47, 000	.001650	.000050	....	....	
9, 600	48, 000	.001700	.000050	....	....	
9, 800	49, 000	.001750	.000050	....	....	
10, 000	50, 000	.001800	.000050	....	....	Elastic limit.
10, 200	51, 000	.001900	.000100	....	....	
10, 400	52, 000	.004400	.002500	....	....	
10, 600	53, 000	.007000	.002600	....	....	
10, 800	54, 000	.008000	.001000	....	....	
11, 000	55, 000	.009750	.001750	....	....	
11, 200	56, 000	.011000	.001250	....	....	
11, 400	57, 000	.012250	.091250	....	....	
11, 600	58, 000	.013500	.001250	....	....	
11, 800	59, 000	.014600	.001100	....	....	
12, 000	60, 000	.015600	.001000	....	....	
12, 400	62, 000	.017600	.002000	....	....	
12, 800	64, 000	.020250	.002650	....	....	
13, 200	66, 000	.023250	.003000	....	....	
13, 600	68, 000	.026900	.003650	....	....	
14, 000	70, 000	.030050	.003150	....	....	
14, 400	72, 000	.033750	.003700	....	....	
14, 800	74, 000	.037750	.004000	....	....	
15, 200	76, 000	.042750	.005000	....	....	
15, 600	78, 000	.049000	.006250	....	....	
16, 000	80, 000	.057300	.008300	....	....	
16, 400	82, 000	.0650	.0077	....	....	
16, 800	84, 000	.0850	.0200	....	....	
17, 140	85, 700	.1300	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	85, 700
Elastic limit per square inch of original section	do	50, 000
Elongation per inch after rupture	inch	0. 2400
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.145
Reduction in area after rupture, per centum of original section		49. 1
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.83*, ″.15

No. 3351.

Marks, $\frac{32\ R_{c}\ T}{M\ T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	Elastic limit.
9,600	48,000	.006250	.004650	....	....	
9,800	49,000	.007600	.001350	....	....	
10,000	50,000	.008500	.000900	....	....	
10,400	52,000	.010650	.002150	....	....	
10,800	54,000	.012650	.002000	....	....	
11,200	56,000	.015000	.002350	....	....	
11,600	58,000	.017250	.002250	....	....	
12,000	60,000	.020000	.002750	....	....	
12,400	62,000	.022800	.002800	....	....	
12,800	64,000	.025850	.003050	....	....	
13,200	66,000	.029250	.003400	....	....	
13,600	68,000	.033000	.003750	....	....	
14,000	70,000	.037250	.004250	....	....	
14,400	72,000	.042750	.005500	....	....	
14,800	74,000	.049500	.006750	....	....	
15,200	76,000	.056750	.007250	....	....	
15,600	78,000	.0625	.005750	....	....	
16,000	80,000	.0850	.0225	....	....	
16,320	81,600	.1300	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	81,600
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.2350
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.165
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		1″.10 from neck
Character of broken surface		silky
Elongation of inch sections		″.84*, ″.13

No. 3352.

Marks, $\overset{32\ R_{67}\ T}{M\ T_{2}\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000700	.000100	0.	....	
6,000	30,000	.000900	.000200	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001550	0.	....	....	
9,800	49,000	.001600	.000050	....	....	Elastic limit.
10,000	50,000	.004900	.003300	....	....	
10,200	51,000	.006150	.001250	....	....	
10,400	52,000	.007750	.001600	....	....	
10,600	53,000	.008700	.000950	....	....	
10,800	54,000	.009600	.000900	....	....	
11,000	55,000	.010600	.001000	....	....	
11,200	56,000	.011750	.001150	....	....	
11,600	58,000	.014000	.002250	....	....	
12,000	60,000	.016300	.002300	....	....	
12,400	62,000	.019200	.002900	....	....	
12,800	64,000	.021500	.002300	....	....	
13,200	66,000	.024250	.002750	....	....	
13,600	68,000	.027300	.003050	....	....	
14,000	70,000	.030600	.003300	....	....	
14,400	72,000	.034550	.003950	....	....	
14,800	74,000	.038900	.004350	....	....	
15,200	76,000	.044250	.005350	....	....	
15,600	78,000	.050500	.006250	....	....	
16,000	80,000	.059300	.008800	....	....	
16,400	82,000	.0650	.0057	....	....	
16,800	84,000	.0950	.0300	....	....	
16,890	84,450	.1100	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	84,450
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.075
Reduction in area after rupture, per centum of original section		27.4
Position of rupture		″.80 from neck
Character of broken surface		granular; flaky spot at the circumference
Elongation of inch sections		″.08, ″.22*

No. 3464.

Marks, $\frac{32}{M}\,\frac{Re}{T},\,\frac{T}{M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000700	.000250	0.	....	
5, 000	25, 000	.000850	.000150	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001350	000200	0.	....	
9, 000	45, 000	.001500	.000150	....	....	
9, 200	46, 000	.001550	.000050	....	....	Elastic limit.
9, 400	47, 000	.005000	.003450	....	....	
9, 600	48, 000	.007500	.002500	....	....	
9, 800	49, 000	.008800	.001300	....	....	
10, 000	50, 000	.009850	.001050	....	....	
10, 200	51, 000	.010600	.000750	....	....	
10, 400	52, 000	.011550	.000950	....	....	
10, 600	53, 000	.012600	.001050	....	....	
10, 800	54, 000	.013750	.001150	....	....	
11, 000	55, 000	.014900	.001150	....	....	
11, 200	56, 000	.015850	.000950	....	....	
11, 400	57, 000	.017000	.001150	....	....	
11, 600	58, 000	.018250	.001250	....	....	
11, 800	59, 000	.019500	.001250	....	....	
12, 000	60, 000	.021000	.001500	....	....	
12, 400	62, 000	.023900	.002900	....	....	
12, 800	64, 000	.027100	.003200	....	....	
13, 200	66, 000	.030100	.003300	....	....	
13, 600	68, 000	.034350	.003950	....	....	
14, 000	70, 000	.038700	.004350	....	....	
14, 400	72, 000	.043900	.005200	....	....	
14, 800	74, 000	.051250	.007350	....	....	
15, 200	76, 000	.059500	.008250	....	....	
15, 600	78, 000	.071750	.012250	....	....	
16, 000	80, 000	.0900	.018250	....	....	
16, 200	81, 000	.1200	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	81, 000
Elastic limit per square inch of original section	do....	46, 000
Elongation per inch after rupture	inch..	0. 2050
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51. 9
Position of rupture		″.60 from neck
Character of broken surface		silky
Elongation of inch sections		″.34*, ″.07

No. 3465.

Marks, $^{32\ R_4\ T}_{M\ T_4\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000250	.000100	0.		
3,000	15,000	.000450	.000200	0.		
4,000	20,000	.000600	.000150	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000950	.000200	0.		
7,000	35,000	.001100	.000150	0.		
8,000	40,000	.001250	.000150	0.		
9,000	45,000	.001450	.000200			
9,200	46,000	.001500	.000050			
9,400	47,000	.001550	.000050			
9,600	48,000	.001600	.000050			
9,800	49,000	.001650	.000050			Elastic limit.
10,000	50,000	.005150	.003500			
10,200	51,000	.006500	.001350			
10,400	52,000	.007550	.001050			
10,600	53,000	.008400	.000850			
10,800	54,000	.009400	.001000			
11,000	55,000	.010400	.001000			
11,200	56,000	.011400	.001000			
11,400	57,000	.012400	.001000			
11,600	58,000	.013350	.000950			
11,800	59,000	.014350	.001000			
12,000	60,000	.015350	.001000			
12,400	62,000	.017850	.002500			
12,800	64,000	.020350	.002500			
13,200	66,000	.023000	.002650			
13,600	68,000	.025900	.002900			
14,000	70,000	.029150	.003250			
14,400	72,000	.032850	.003700			
14,800	74,000	.037000	.004150			
15,200	76,000	.041100	.004100			
15,600	78,000	.047500	.006400			
16,000	80,000	.054250	.006750			
16,400	82,000	.063400	.009150			
16,800	84,000	.0800	.0166			
17,200	86,000	.1200	.0400			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	86,000
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1550
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.075
Reduction in area after rupture, per centum of original section		27.4
Position of rupture		″.60 from neck
Character of broken surface		granular 50 per cent.; silky serrated 50 per cent.
Elongation of inch sections		″.22, ″.09

No. 3287.

Marks, $^{32\ R_{44}\ T}_{B\ T_1\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000250	.000200	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001500	0.	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	Elastic limit.
10,000	50,000	.007250	.005600	....	....	
10,200	51,000	.008600	.001350	....	....	
10,400	52,000	.009350	.000750	....	....	
10,600	53,000	.010300	.000950	....	....	
10,800	54,000	.011500	.001200	....	....	
11,000	55,000	.012500	.001000	....	....	
11,200	56,000	.013550	.001050	....	....	
11,400	57,000	.014600	.001050	....	....	
11,600	58,000	.015650	.001050	....	....	
11,800	59,000	.017000	.001350	....	....	
12,000	60,000	.018000	.001000	....	....	
12,400	62,000	.020750	.002750	....	....	
12,800	64,000	.023600	.002850	....	....	
13,200	66,000	.026150	.002550	....	....	
13,600	68,000	.030000	.003850	....	....	
14,000	70,000	.033500	.003500	....	....	
14,400	72,000	.037900	.004400	....	....	
14,800	74,000	.043000	.005100	....	....	
15,200	76,000	.049000	.006000	....	....	
15,600	78,000	.056250	.007250	....	....	
16,000	80,000	.0650	.008750	....	....	
16,400	82,000	.0800	.0150	....	....	
16,800	84,000	.1050	.0250	....	....	
16,940	84,700	.1500	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	84,700
Elastic limit per square inch of original section	do ...	49,000
Elongation per inch after rupture	inch..	0.2550
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".60 from neck
Character of broken surface		silky
Elongation of inch sections		".37*, ".14

No. 3288.

Marks, $\frac{32\ \mathrm{R}_{64}\ \mathrm{T}}{\mathrm{B}\ \mathrm{T}_2\ \mathrm{M}}$
Diameter, ".504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	
9,600	48,000	.001650	.000050	....	....	Elastic limit.
9,800	49,000	.004400	.002750	....	....	
10,000	50,000	.004900	.000500	....	....	
10,200	51,000	.005650	.000750	....	....	
10,400	52,000	.006800	.001150	....	....	
10,600	53,900	.010000	.003200	....	....	
10,800	54,000	.011500	.001500	....	....	
11,000	55,000	.012500	.001000	....	....	
11,200	56,000	.013500	.001000	....	....	
11,400	57,000	.014500	.001000	....	....	
11,600	58,000	.015500	.001000	....	....	
11,800	59,000	.016750	.001250	....	....	
12,000	60,000	.018350	.001600	....	....	
12,400	62,000	.020350	.002000	....	....	
12,800	64,000	.023250	.002900	....	....	
13,200	66,000	.026500	.003250	....	....	
13,600	68,000	.030350	.003850	....	....	
14,000	70,000	.033500	.003150	....	....	
14,400	72,000	.038050	.004550	....	....	
14,800	74,000	.042850	.004800	....	....	
15,200	76,000	.048750	.005900	....	....	
15,600	78,000	.057000	.008250	....	....	
16,000	80,000	.0650	.0080	....	....	
16,400	82,000	.0850	.0200	....	....	
16,520	82,600	.1050	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	82,600
Elastic limit per square inch of original section	do	48,000
Elongation per inch after rupture	inch	0.1850
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		".35 from neck
Character of broken surface		silky
Elongation of inch sections		".29*, ".08

No. 3289.

Marks, $\substack{32\ \text{Ra}\ \text{T} \\ \text{M}\ \text{T}_1\ \text{M}}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000450	.000150	0.		
4,000	20,000	.000650	.000200	0.		
5,000	25,000	.000800	.000150	0.		
6,000	30,000	.000950	.000150	0.		
7,000	35,000	.001100	.000150	0.		
8,000	40,000	.001250	.000150	0.		
8,200	41,000	.001300	.000050			
8,400	42,000	.001350	.000050			
8,600	43,000	.001350	0.			
8,800	44,000	.001400	.000050			
9,000	45,000	.001450	.000050			Elastic limit.
9,200	46,000	.001550	.000100			
9,400	47,000	.003000	.001450			
9,600	48,000	.004500	.001500			
9,800	49,000	.006850	.002350			
10,000	50,000	.008250	.001400			
10,400	52,000	.009500	.001250			
10,800	54,000	.011550	.002050			
11,200	56,000	.013500	.001950			
11,600	58,000	.015600	.002100			
12,000	60,000	.017900	.002300			
12,400	62,000	.020250	.002350			
12,800	64,000	.022550	.002300			
13,200	66,000	.025000	.002450			
13,600	68,000	.028000	.003000			
14,000	70,000	.031750	.003750			
14,400	72,000	.035100	.003350			
14,800	74,000	.039300	.004200			
15,200	76,000	.044500	.005200			
15,600	78,000	.049750	.005250			
16,000	80,000	.0575	.007750			
16,400	82,000	.0650	.0075			
16,800	84,000	.0800	.0150			
17,200	86,000	.1150	.0350			
17,290	86,450	.1450	.0300			Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 86,450
Elastic limit per square inch of original section ....do.... 45,000
Elongation per inch after rupture ....inch.. 0.2050
Elongation per inch under strain at elastic limit....................do.... .001450
Reduction in diameter at point of rupture ....do.... .094
Reduction in area after rupture, per centum of original section.................... 34.0
Position of rupture ....″.60 from neck
Character of broken surface....................granular, 50 per cent.; silky, flaky, 50 per cent.
Elongation of inch sections....................″.12, ″.29*

No. 3290.

Marks, $\substack{33\ \mathrm{R_{12}}\ \mathrm{T} \\ \mathrm{M}\ \mathrm{T_2}\ \mathrm{M}}$

Diameter, ″.504.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000800	.000200	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7, 000	35, 000	.001100	.000500	0.	....	
8, 000	40, 000	.001300	.000200	0.	....	
8, 200	41, 000	.001350	.000050	....	....	
8, 400	42, 000	.001400	.000050	....	....	
8, 600	43, 000	.001450	.000050	....	....	
8, 800	44, 000	.001450	0.	....	....	Elastic limit.
9, 000	45, 000	.001600	.000150	....	....	
9, 200	46, 000	.003500	.001900	....	....	
9, 400	47, 000	.004500	.001000	....	....	
9, 600	48, 000	.005750	.001250	....	....	
9, 800	49, 000	.007400	.001650	....	....	
10, 000	50, 000	.008900	.001500	....	....	
10, 400	52, 000	.010400	.001500	....	....	
10, 800	54, 000	.011850	.001450	....	....	
11, 200	56, 000	.013750	.001900	....	....	
11, 600	58, 000	.015500	.001750	....	....	
12, 000	60, 000	.018100	.002600	....	....	
12, 400	62, 000	.020500	.002400	....	....	
12, 800	64, 000	.022750	.002250	....	....	
13, 200	66, 000	.025500	.002750	....	....	
13, 600	68, 000	.028750	.003250	....	....	
14, 000	70, 000	.032300	.003550	....	....	
14, 400	72, 000	.035600	.003300	....	....	
14, 800	74, 000	.040000	.004400	....	....	
15, 200	76, 000	.045250	.005250	....	....	
15, 600	78, 000	.050000	.004750	....	....	
16, 000	80, 000	.059650	.009650	....	....	
16, 400	82, 000	.0700	.010350	....	....	
16, 800	84, 000	.0900	.0200	....	....	
17, 150	85, 750	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85, 750
Elastic limit per square inch of original section	do ...	44, 000
Elongation per inch after rupture	inch..	0. 2150
Elongation per inch under strain at elastic limit	do	.001450
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		40. 3
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.10

No. 3295.

Marks, $^{32\ R_4\ T}_{B\ T_1\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	.000050	.000050	
2,000	10,000	.000250	.000150	.000050	0.	
3,000	15,000	.000400	.000150	.000050	0.	
4,000	20,000	.000550	.000150	.000050	0.	
5,000	25,000	.000750	.000200	.000050	0.	
6,000	30,000	.000900	.000150	.000030	0.	
7,000	35,000	.001050	.000150	.000050	0.	
8,000	40,000	.001250	.000200	.000050	0.	
9,000	45,000	.001400	.000150	....	....	
9,200	46,000	.001450	.000050	....	....	
9,400	47,000	.001500	.000050	....	....	
9,600	48,000	.001550	.000050	....	....	Elastic limit.
9,800	49,000	.011500	.009950	....	....	
10,000	50,000	.012250	.000750	....	....	
10,200	51,000	.013000	.000750	....	....	
10,400	52,000	.013500	.000500	....	....	
10,600	53,000	.014500	.001000	....	....	
10,800	54,000	.015850	.001350	....	....	
11,200	56,000	.018250	.002400	....	....	
11,600	58,000	.021050	.002800	....	....	
12,000	60,000	.023900	.002850	....	....	
12,400	62,000	.027500	.003600	....	....	
12,800	64,000	.031750	.004250	....	....	
13,200	66,000	.035600	.003850	....	....	
13,600	68,000	.040500	.004900	....	....	
14,000	70,000	.046350	.005850	....	....	
14,400	72,000	.054250	.007900	....	....	
14,800	74,000	.063250	.009000	....	....	
15,200	76,000	.0750	.011750	....	....	
15,600	78,000	.1000	.0250	....	....	
15,920	79,600	.1600	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	79,600
Elastic limit per square inch of original section	do	48,000
Elongation per inch after rupture	inch	0.2600
Elongation per inch under strain at elastic limit	do	.001550
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".70 from neck
Character of broken surface		silky
Elongation of inch sections		".16, ".36*

No. 3296.

Marks, $\overset{32\ R_{44}\ T}{B\ T_3\ M}$
Diameter, ".504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001400	.000200	0.	....	
9,000	45,000	.001550	.000150	....	....	
9,200	46,000	.001600	.000050	....	....	Elastic limit.
9,400	47,000	.003050	.001450	....	....	
9,600	48,000	.004100	.001050	....	....	
9,800	49,000	.008600	.004500	....	....	
10,000	50,000	.009500	.000900	....	....	
10,200	51,000	.010350	.000850	....	....	
10,400	52,000	.011550	.001200	....	....	
10,800	54,000	.013750	.002200	....	....	
11,200	56,000	.016100	.002350	....	....	
11,600	58,000	.019000	.002900	....	....	
12,000	60,000	.021750	.002750	....	....	
12,400	62,000	.024300	.002550	....	....	
12,800	64,000	.027850	.003550	....	....	
13,200	66,000	.031250	.003400	....	....	
13,600	68,000	.035600	.004350	....	....	
14,000	70,000	.040050	.004450	....	....	
14,400	72,000	.046250	.006200	....	....	
14,800	74,000	.053500	.007250	....	....	
15,200	76,000	.060750	.007250	....	....	
15,600	78,000	.074500	.013750	....	....	
16,000	80,000	.0900	.0155	....	....	
16,390	81,950	.1500	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	81,950
Elastic limit per square inch of original section	do....	46,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".55 from neck
Character of broken surface		silky
Elongation of inch sections		".35*, ".13

No. 3297.

Marks, $\overset{32\ \text{R}_{44}\ \text{T}}{\text{M T}_1\ \text{M}}$

Diameter, ".504.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001550	0.	....	....	Elastic limit.
9,600	48,000	.006350	.004800	....	....	
9,800	49,000	.007150	.000800	....	....	
10,000	50,000	.007900	.000750	....	....	
10,400	52,000	.009850	.001950	....	....	
10,800	54,000	.011700	.001850	....	....	
11,200	56,000	.013750	.002050	....	....	
11,600	58,000	.015850	.002100	....	....	
12,000	60,000	.018000	.002150	....	....	
12,400	62,000	.020600	.002600	....	....	
12,800	64,000	.023250	.002650	....	....	
13,200	66,000	.025750	.002500	....	....	
13,600	68,000	.029150	.003400	....	....	
14,000	70,000	.032750	.003600	....	....	
14,400	72,000	.037000	.004250	....	....	
14,800	74,000	.041000	.004000	....	....	
15,200	76,000	.046500	.005500	....	....	
15,600	78,000	.053750	.007250	....	....	
16,000	80,000	.062500	.008750	....	....	
16,400	82,000	.074000	.011500	....	....	
16,800	84,000	.0950	.0210	....	....	
17,050	85,250	.1450	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85,250
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.2300
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".50 from neck
Character of broken surface		silky
Elongation of inch sections		".34*, ".12

No. 3298.

Marks, $\overset{32\,R_{14}\,T}{M\;T,\;M}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	.000050	.000050	
2,000	10,000	.000300	.000150	.000050	0.	
3,000	15,000	.000500	.000200	.000050	0.	
4,000	20,000	.000700	.000200	.000050	0.	
5,000	25,000	.000900	.000200	.000050	0.	
6,000	30,000	.001030	.000150	.000100	.000050	
7,000	35,000	.001250	.000200	.000100	0.	
8,000	40,000	.001450	.000200	.000100	0.	
9,000	45,000	.001650	.000200	....	....	Elastic limit.
9,200	46,000	.002000	.000350	....	....	
9,400	47,000	.002400	.000400	....	....	
9,600	48,000	.003050	.000650	....	....	
9,800	49,000	.007500	.004450	....	....	
10,000	50,000	.008250	.000750	....	....	
10,400	52,000	.009750	.001500	....	....	
10,800	54,000	.011600	.001850	....	....	
11,200	56,000	.013100	.001500	....	....	
11,600	58,000	.015400	.002300	....	....	
12,000	60,000	.017850	.002450	....	....	
12,400	62,000	.020150	.002300	....	....	
12,800	64,000	.022750	.002600	....	....	
13,200	66,000	.025100	.002850	....	....	
13,600	68,000	.028350	.003250	....	....	
14,000	70,000	.031750	.003400	....	....	
14,400	72,000	.035500	.003750	....	....	
14,800	74,000	.040000	.004500	....	....	
15,200	76,000	.044250	.004250	....	....	
15,600	78,000	.051250	.007000	....	....	
16,000	80,000	.058250	.007000	....	....	
16,400	82,000	.067500	.009250	....	....	
16,800	84,000	.081750	.014250	....	....	
17,200	86,000	.1050	.023250	....	....	
17,870	88,850	.1500	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	88,850
Elastic limit per square inch of original section	do	45,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.34*

No. 3455.

Marks, $\substack{32\ R_{44}\ T \\ B\ T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001800	.000100	....	....	Elastic limit.
10,400	52,000	.002700	.000900	....	....	
10,600	53,000	.004050	.001350	....	....	
10,800	54,000	.005000	.000950	....	....	
11,000	55,000	.006500	.001500	....	....	
11,200	56,000	.008000	.001500	....	....	
11,400	57,000	.009000	.001000	....	....	
11,600	58,000	.010000	.001000	....	....	
11,800	59,000	.010850	.000850	....	....	
12,000	60,000	.012100	.001250	....	....	
12,400	62,000	.013900	.001800	....	....	
12,800	64,000	.016250	.002350	....	....	
13,200	66,000	.018750	.002500	....	....	
13,600	68,000	.020800	.002050	....	....	
14,000	70,000	.023400	.002600	....	....	
14,400	72,000	.026750	.003350	....	....	
14,800	74,000	.029800	.003050	....	....	
15,200	76,000	.032850	.003050	....	....	
15,600	78,000	.036750	.003900	....	....	
16,000	80,000	.040850	.004100	....	....	
16,400	82,000	.046500	.005650	....	....	
16,800	84,000	.053000	.006500	....	....	
17,200	86,000	.061250	.008250	....	....	
17,600	88,000	.0750	.013750	....	....	
18,000	90,000	.0950	.0200	....	....	
18,080	90,400	.1300	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 90,400
Elastic limit per square inch of original section..do.... 51,000
Elongation per inch after rupture...inch.. 0.2100
Elongation per inch under strain at elastic limit..do.... .001800
Reduction in diameter at point of rupture...do.... .135
Reduction in area after rupture, per centum of original section.............................. 46.2
Position of rupture..″.55 from neck
Character of broken surface...silky
Elongation of inch sections...″.31*, ″.11

No. 3456.

Marks, $^{32\ R_4\ T}_{B\ T_2\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000450	.000150	0.		
4,000	20,000	.000650	.000200	0.		
5,000	25,000	.000850	.000200	0.		
6,000	30,000	.001000	.000150	0.		
7,000	35,000	.001200	.000200	0.		
8,000	40,000	.001350	.000150	0.		
9,000	45,000	.001500	.000150			
9,200	46,000	.001500	0.			
9,400	47,000	.0015 0	.000050			
9,600	48,000	.001600	.000050			
9,800	49,000	.001650	.000050			
10,000	50,000	.001650	0.			
10,200	51,000	.001750	.000100			
10,400	52,000	.001850	.000100			Elastic limit.
10,600	53,000	.002150	.000300			
10,800	54,000	.003250	.001100			
11,000	55,000	.005500	.002250			
11,200	56,000	.006850	.001350			
11,400	57,000	.008000	.001150			
11,600	58,000	.009000	.001000			
11,800	59,000	.009900	.000900			
12,000	60,000	.011000	.001100			
12,400	62,000	.012500	.001500			
12,800	64,000	.014350	.001850			
13,200	66,000	.016400	.002050			
13,600	68,000	.018600	.002200			
14,000	70,000	.021100	.002500			
14,400	72,000	.023750	.002650			
14,800	74,000	.026500	.002750			
15,200	76,000	.029550	.003050			
15,600	78,000	.032750	.003200			
16,000	80,000	.036550	.003800			
16,400	82,000	.041000	.004450			
16,800	84,000	.046550	.005550			
17,200	86,000	.052250	.005700			
17,600	88,000	.061500	.009250			
18,000	90,000	.0675	.0060			
18,400	92,000	.1000	.0325			
18,480	92,400	.1200	.0200			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	92,400
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2150
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.185
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		".21*, ".22*

No. 3457.

Marks, $\frac{32\ \text{Rs}\ \text{T}}{\text{M}\ \text{T}_1\ \text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001050	.000100	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	Elastic limit.
9,800	49,000	.003750	.002150	....	....	
10,000	50,000	.005500	.001750	....	....	
10,200	51,000	.007050	.001550	....	....	
10,400	52,000	.007900	.000850	....	....	
10,600	53,000	.008500	.000600	....	....	
10,800	54,000	.009250	.000750	....	....	
11,000	55,000	.010050	.000800	....	....	
11,200	56,000	.010850	.000800	....	....	
11,400	57,000	.011900	.001050	....	....	
11,600	58,000	.012900	.001000	....	....	
11,800	59,000	.013900	.001000	....	....	
12,000	60,000	.015050	.001150	....	....	
12,400	62,000	.017150	.002100	....	....	
12,800	64,000	.019550	.002400	....	....	
13,200	66,000	.022000	.002450	....	....	
13,600	68,000	.024750	.002750	....	....	
14,000	70,000	.027750	.003000	....	....	
14,400	72,000	.030850	.003100	....	....	
14,800	74,000	.034500	.003650	....	....	
15,200	76,000	.039250	.004750	....	....	
15,600	78,000	.044500	.005250	....	....	
16,000	80,000	.049750	.005250	....	....	
16,400	82,000	.057750	.008000	....	....	
16,800	84,000	.0685	.010750	....	....	
17,200	86,000	.0800	.0115	....	....	
17,600	88,000	.1100	.0300	....	....	
17,690	88,450	.1550	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 88,450
Elastic limit per square inch of original section ....do.... 48,000
Elongation per inch after rupture....................inch.. 0.2450
Elongation per inch under strain at elastic limit....................do .... .001600
Reduction in diameter at point of rupture ....do.... .125
Reduction in area after rupture, per centum of original section.................... 43.8
Position of rupture ....″.65 from neck
Character of broken surface....................silky
Elongation of inch sections....................″.16, ″.86

No. 3458.

Marks, $\begin{matrix}32\ R_{45}\ T\\ M\ T_2\ M\end{matrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000550	.000100	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001200	.000150	0.	....	
9,000	45,000	.001400	.000200	....	....	
9,200	46,000	.001450	.000050	....	....	
9,400	47,000	.001500	.000050	....	....	
9,600	48,000	.001550	.000050	....	....	
9,800	49,000	.001600	.000050	....	....	Elastic limit.
10,000	50,000	.002750	.001150	....	....	
10,200	51,000	.003300	.000550	....	....	
10,400	52,000	.005750	.002450	....	....	
10,600	53,000	.007000	.001250	....	....	
10,800	54,000	.008250	.001250	....	....	
11,000	55,000	.009000	.000750	....	....	
11,200	56,000	.010150	.001150	....	....	
11,400	57,000	.010850	.000700	....	....	
11,600	58,000	.011650	.000800	....	....	
11,800	59,000	.012650	.001000	....	....	
12,000	60,000	.013600	.000950	....	....	
12,400	62,000	.015850	.002250	....	....	
12,800	64,000	.018100	.002250	....	....	
13,200	66,000	.020150	.002050	....	....	
13,600	68,000	.022750	.00260C	....	....	
14,000	70,000	.025600	.002850	....	....	
14,400	72,000	.028500	.002900	....	....	
14,800	74,000	.031750	.003250	....	....	
15,200	76,000	.035000	.003250	....	....	
15,600	78,000	.039000	.004000	....	....	
16,000	80,000	.043750	.004750	....	....	
16,400	82,000	.049500	.005750	....	....	
16,800	84,000	.057000	.007500	....	....	
17,200	86,000	.065650	.008650	....	....	
17,600	88,000	.0800	.014350	....	....	
18,000	90,000	.1200	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90,000
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1850
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		37.1
Position of rupture		″.45 from neck
Character of broken surface		silky, trace of granulation
Elongation of inch sections		″.09, ″.28*

No. 3386.

Marks, $\substack{32\ R_{47}\ T \\ B\ T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	Elastic limit.
9,800	49,000	.004750	.003150	....	....	
10,000	50,000	.006400	.001650	....	....	
10,200	51,000	.007250	.000850	....	....	
10,400	52,000	.008100	.000850	....	....	
10,600	53,000	.008750	.000650	....	....	
10,800	54,000	.009900	.001150	....	....	
11,000	55,000	.010600	.000700	....	....	
11,200	56,000	.011550	.000950	....	....	
11,600	58,000	.013700	.002150	....	....	
12,000	60,000	.015950	.002250	....	....	
12,400	62,000	.018250	.002300	....	....	
12,800	64,000	.020500	.002250	....	....	
13,200	66,000	.023500	.003000	....	....	
13,600	68,000	.026250	.002750	....	....	
14,000	70,000	.029000	.002750	....	....	
14,400	72,000	.032250	.003250	....	....	
14,800	74,000	.035600	.003350	....	....	
15,200	76,000	.039750	.004150	....	....	
15,600	78,000	.044700	.005050	....	....	
16,000	80,000	.051000	.006300	....	....	
16,400	82,000	.058500	.007500	....	....	
16,800	84,000	.0650	.0065	....	....	
17,200	86,000	.0800	.0150	....	....	
17,600	88,000	.1100	.0300	....	....	
17,670	88,350	.1500	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	88,350
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.30*, ″.12

No. 3387.

Marks, $^{32\ \mathrm{R}_4,\ \mathrm{T}}_{\mathrm{B\ T,\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3 000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001100	.000200	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
9,200	46,000	.001450	.000050	....	....	Elastic limit.
9,400	47,000	.001600	.000150	....	....	
9,600	48,000	.006300	.004700	....	....	
9,800	49,000	.007250	.000950	....	....	
10,000	50,000	.007850	.000600	....	....	
10,200	51,000	.008750	.000900	....	....	
10,400	52,000	.009500	.000750	....	....	
10,600	53,000	.010100	.000600	....	....	
10,800	54,000	.011000	.000900	....	....	
11,000	55,000	.012500	.001500	....	....	
11,200	56,000	.013750	.001250	....	....	
11,400	57,000	.015400	.001650	....	....	
11,600	58,000	.015900	.000500	....	....	
11,800	59,000	.016500	.000600	....	....	
12,000	60,000	.018250	.001750	....	....	
12,400	62,000	.020900	.002650	....	....	
12,800	64,000	.022500	.001600	....	....	
13,200	66,000	.025000	.002500	....	....	
13,600	68,000	.028500	.003500	....	....	
14,000	70,000	.031750	.003250	....	....	
14,400	72,000	.035250	.003500	....	....	
14,800	74,000	.039000	.003750	....	....	
15,200	76,000	.043250	.004250	....	....	
15,600	78,000	.049250	.006000	....	....	
16,000	80,000	.056000	.006750	....	....	
16,400	82,000	.0650	.0090	....	....	
16,800	84,000	.0750	.0100	....	....	
17,200	86,000	.0950	.0200	....	....	
17,520	87,600	.1500	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	87,600
Elastic limit per square inch of original section	do	46,000
Elongation per inch after rupture	inch	0.2550
Elongation per inch under strain at elastic limit	do	.001450
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.18, ″.33*

No. 3388.

Marks, $\frac{33}{M}\frac{R_e}{T},\frac{T}{M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000250	.000100	0.	....	
3, 000	15, 000	.000400	.000150	0.	....	
4, 000	20, 000	.000550	.000150	0.	....	
5, 000	25, 000	.000700	.000150	0.	....	
6, 000	30, 000	.000900	.000200	0.	....	
7, 000	35, 000	.001050	.000150	0.	....	
8, 000	40, 000	.001200	.000150	0.	....	
9, 000	45, 000	.001400	.000200	....	....	
9, 200	46, 000	.001450	.000050	....	....	
9, 400	47, 000	.001550	.000100	....	....	
9, 600	48, 000	.001600	.000050	....	....	Elastic limit.
9, 800	49, 000	.003100	.001500	....	....	
10, 000	50, 000	.004750	.001650	....	....	
10, 200	51, 000	.006000	.001250	....	....	
10, 400	52, 000	.007000	.001000	....	....	
10, 600	53, 000	.007450	.000450	....	....	
10, 800	54, 000	.008200	.000750	....	....	
11, 000	55, 000	.009150	.000950	....	....	
11, 200	56, 000	.010100	.000950	....	....	
11, 400	57, 000	.011000	.000900	....	....	
11, 600	58, 000	.011850	.000850	....	....	
11, 800	59, 000	.012850	.001000	....	....	
12, 000	60, 000	.013900	.001050	....	....	
12, 400	62, 000	.016000	.002100	....	....	
12, 800	64, 000	.017900	.001900	....	....	
13, 200	66, 000	.020500	.002600	....	....	
13, 600	68, 000	.023000	.002500	....	....	
14, 000	70, 000	.025500	.002500	....	....	
14, 400	72, 000	.028750	.003250	....	....	
14, 800	74, 000	.032000	.003250	....	....	
15, 200	76, 000	.035250	.003250	....	....	
15, 600	78, 000	.038800	.003550	....	....	
16, 000	80, 000	.043750	.004950	....	....	
16, 400	82, 000	.049500	.005750	....	....	
16, 800	84, 000	.056250	.006750	....	....	
17, 200	86, 000	.0650	.008750	....	....	
17, 600	88, 000	.0800	.0150	....	....	
18, 000	90, 000	.1050	.0230	....	....	
18, 160	90, 800	.1450	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90, 800
Elastic limit per square inch of original section	do....	48, 000
Elongation per inch after rupture	inch..	0. 2350
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40. 8
Position of rupture		″1.00 from neck
Character of broken surface		silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		″.16, ″.31*

No. 3389.

Marks, $\substack{\text{82 R}_r\text{ T}\\ \text{M T}_3\text{ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000500	.000200	0.	....	
4, 000	20, 000	.000650	.000150	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 600	.001150	.000150	0.	....	
8, 000	40, 000	.001300	.000150	0.	....	
9, 000	45, 000	.001450	.000150	....	....	
9, 200	46, 000	.001500	.000050	....	....	
9, 400	47, 000	.001550	.000050	....	....	
9, 600	48, 000	.001550	0.	....	....	
9, 800	49, 000	.001600	.000050	....	....	
10, 000	50, 000	.001650	.000050	....	....	Elastic limit.
10, 200	51, 000	.001800	.000150	....	....	
10, 400	52, 000	.004750	.002950	....	....	
10, 600	53, 000	.005500	.000750	....	....	
10, 800	54, 000	.006500	.001000	....	....	
11, 000	55, 000	.007350	.000850	....	....	
11, 200	56, 000	.008250	.000900	....	....	
11, 400	57, 000	.009100	.000850	....	....	
11, 600	58, 000	.010050	.000960	....	....	
11, 800	59, 000	.011000	.000950	....	....	
12, 000	60, 000	.011900	.000900	....	....	
12, 400	62, 000	.014150	.002250	....	....	
12, 800	64, 000	.016250	.002100	....	....	
13, 200	66, 000	.018350	.002100	....	....	
13, 600	68, 000	.020600	.002250	....	....	
14, 000	70, 000	.023250	.002650	....	....	
14, 400	72, 000	.026250	.003000	....	....	
14, 800	74, 000	.029250	.003000	....	....	
15, 200	76, 000	.033000	.003750	....	....	
15, 600	78, 000	.036250	.003250	....	....	
16, 000	80, 000	.040000	.003750	....	....	
16, 400	82, 000	.044500	.004500	....	....	
16, 800	84, 000	.050750	.006250	....	....	
17, 200	86, 000	.058250	.007500	....	....	
17, 600	88, 000	.0700	.011750	....	....	
18, 000	90, 000	.0850	.0150	....	....	
18, 280	91, 400	.1250	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91, 400
Elastic limit per square inch of original section	do ...	50, 000
Elongation per inch after rupture	inch..	0. 2300
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40. 3
Position of rupture		1″.05 from neck
Character of broken surface		silky
Elongation of inch sections		″.27*, ″.19

No. 3291.

Marks, $\substack{32\ R_{s}\ T \\ B\ T_{1}\ M}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000250	.000100	0.	....	
3, 000	15, 000	.000450	.000200	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000800	.000200	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7, 000	35, 000	.001100	.000150	0.	....	
8, 000	40, 000	.001250	.000150	0.	....	
9, 000	45, 000	.001450	.000200	....	....	
9, 200	46, 000	.001450	0.	....	....	
9, 400	47, 000	.001500	.000050	....	....	
9, 600	48, 000	.001550	.000050	....	....	Elastic limit.
9, 800	49, 000	.010250	.008700	....	....	
10, 000	50, 000	.010750	.000500	....	....	
10, 200	51, 000	.011400	.000650	....	....	
10, 400	52, 000	.012350	.000950	....	....	
10, 600	53, 000	.013300	.000950	....	....	
10, 800	54, 000	.014750	.001450	....	....	
11, 000	55, 000	.016100	.001350	....	....	
11, 200	56, 000	.017350	.001250	....	....	
11, 400	57, 000	.018750	.001400	....	....	
11, 600	58, 000	.020000	.001250	....	....	
11, 800	59, 000	.021200	.001200	....	....	
12, 000	60, 000	.022550	.001350	....	....	
12, 400	62, 000	.025450	.002900	....	....	
12, 800	64, 000	.029000	.003550	....	....	
13, 200	66, 000	.032850	.003850	....	....	
13, 600	68, 000	.037250	.004400	....	....	
14, 000	70, 000	.042000	.004750	....	....	
14, 400	72, 000	.048250	.006250	....	....	
14, 800	74, 000	.056250	.008000	....	....	
15, 200	76, 000	.0650	.008750	....	....	
15, 600	78, 000	.0800	.0150	....	....	
16, 000	80, 000	.1050	.0250	....	....	
16, 300	81, 500	.1600	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	81, 500
Elastic limit per square inch of original section	do ...	48, 000
Elongation per inch after rupture	inch..	0. 2850
Elongation per inch under strain at elastic limit	do	001550
Reduction in diameter at point of rupture	do....	. 134
Reduction in area after rupture, per centum of original section		46. 2
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.19, ″.38*

No. 3292.

Marks, $\frac{32\ R_a\ T}{B\ T,\ M}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.000950	.000100	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001600	.000100	....	....	
9,400	47,000	.001650	.000050	....	....	
9,600	48,000	.001700	.000050	....	....	Elastic limit.
9,800	49,000	.003550	.001850	....	....	
10,000	50,000	.007550	.004000	....	....	
10,200	51,000	.008100	.000550	....	....	
10,400	52,000	.009000	.000900	....	....	
10,600	53,000	.010050	.001050	....	....	
10,800	54,000	.011050	.001000	....	....	
11,000	55,000	.012050	.001000	....	....	
11,200	56,000	.013350	.001300	....	....	
11,400	57,000	.014350	.001000	....	....	
11,600	58,000	.015400	.001050	....	....	
11,800	59,000	.016550	.001150	....	....	
12,000	60,000	.017650	.001100	....	....	
12,400	62,000	.020300	.002650	....	....	
12,800	64,000	.022850	.002550	....	....	
13,200	66,000	.025850	.003000	....	....	
13,600	68,000	.029000	.003150	....	....	
14,000	70,000	.032400	.003400	....	....	
14,400	72,000	.036550	.004150	....	....	
14,800	74,000	.041000	.004450	....	....	
15,200	76,000	.045500	.004500	....	....	
15,600	78,000	.052500	.007000	....	....	
16,000	80,000	.061000	.008500	....	....	
16,400	82,000	.0700	.0090	....	....	
16,800	84,000	.0850	.0150	....	....	
17,190	85,950	.1450	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85,950
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.2450
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.70 from neck
Character of broken surface		silky
Elongation of inch sections		″.17, ″.32*

No. 3293.

Marks, $\frac{32\ R.\ T}{M\ T,\ M}$
Diameter, ''.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000500	.000200	0.	....	
4, 000	20, 000	.000650	.000150	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001200	.000200	0.	....	
8, 000	40, 000	.001350	.000150	0.	....	
9, 000	45, 000	.001550	.000200	....	....	
9, 200	46, 000	.001600	.000050	....	....	Elastic limit.
9, 400	47, 000	.001750	.000150	....	....	
9, 600	48, 000	.002400	.000650	....	....	
9, 800	49, 000	.003250	.000850	....	....	
10, 000	50, 000	.006100	.002850	....	....	
10, 400	52, 000	.008300	.002400	....	....	
10, 800	54, 000	.010250	.001750	....	....	
11, 200	56, 000	.012100	.001850	....	....	
11, 600	58, 000	.014100	.002000	....	....	
12, 000	60, 000	.016400	.002300	....	....	
12, 400	62, 000	.018500	.002100	....	....	
12, 800	64, 000	.021050	.002550	....	....	
13, 200	66, 000	.023400	.002350	....	....	
13, 600	68, 000	.026500	.003100	....	....	
14, 000	70, 000	.029650	.003150	....	....	
14, 400	72, 000	.033100	.003450	....	....	
14, 800	74, 000	.037250	.004150	....	....	
15, 200	76, 000	.041600	.004350	....	....	
15, 600	78, 000	.046500	.004900	....	....	
16, 000	80, 000	.054250	.007750	....	....	
16, 400	82, 000	.0625	.008250	....	....	
16, 800	84, 000	.0750	.0125	....	....	
17, 200	86, 000	.0950	.0200	....	....	
17, 380	86, 900	.1450	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	86, 900
Elastic limit per square inch of original section	do....	46, 000
Elongation per inch after rupture	inch..	0. 2100
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		40. 3
Position of rupture		''.85 from neck
Character of broken surface		silky; in part interspersed with granular metal
Elongation of inch sections		''.29*, ''.13

No. 3294.

Marks, $\frac{32\ R_{48}\ T}{M\ T_2\ M}$.
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000400	.000150	0.	....	
4, 000	20, 000	.000550	.000150	0.	....	
5, 000	25, 000	.000700	.000150	0.	....	
6, 000	30, 000	.000900	.000200	0.	....	
7, 000	35, 000	.001050	.000150	0.	....	
8, 000	40. 000	.001250	.000200	0.	....	
9, 000	45, 000	.001450	.000200	....	....	
9, 200	46, 000	.001500	.000050	....	....	
9, 400	47, 000	.001550	.000050	....	....	
9, 600	48, 000	.001600	.000050	....	....	Elastic limit.
9, 800	49, 000	.001900	.000300	....	....	
10, 000	50, 000	.002400	.000500	....	....	
10, 200	51, 000	.003500	.001100	....	....	
10, 400	52, 000	.004750	.001250	....	....	
10, 600	53, 000	.006100	.001350	....	....	
10, 800	54, 000	.007250	.001150	....	....	
11, 200	56, 000	.009350	.002100	....	....	
11, 600	58, 000	.011400	.002050	....	....	
12, 000	60, 000	.013400	.002000	....	....	
12, 400	62, 000	.015600	.002200	....	....	
12, 800	64, 000	.017750	.002150	....	....	
13, 200	66, 000	.020100	.002350	....	....	
13, 600	68, 000	.022250	.002150	....	....	
14, 000	70, 000	.025850	.003600	....	....	
14, 400	72, 000	.029350	.003500	....	....	
14, 800	74, 000	.032650	.003300	....	....	
15, 200	76, 000	.036500	.003850	....	....	
15, 600	78, 000	.040850	.004350	....	....	
16, 000	80, 000	.046000	.005150	....	....	
16, 400	82, 000	.053250	.007250	....	....	
16, 800	84, 000	.062500	.009250	....	....	
17, 200	86, 000	.0750	.0125	....	....	
17, 600	88, 000	.0950	.0200	....	....	
17, 780	88, 900	.1400	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	88, 900
Elastic limit per square inch of original section	do	48, 000
Elongation per inch after rupture	inch	0. 2800
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		46. 2
Position of rupture		″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.11, ″.35*

No. 3290.

Marks, $\frac{\text{22 R. T}}{\text{B T, M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000450	.000200	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000800	.000200	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7: 000	35, 000	.001100	.000150	0.	....	
8, 000	40, 000	.001300	.000200	0.	....	
8, 200	41, 000	.001350	.000050	....	....	
8, 400	42, 000	.001400	.000050	....	....	
8, 600	43, 000	.001400	0.	....	....	
8, 800	44, 000	.001450	.000050	....	....	Elastic limit.
9, 000	45, 000	.002000	.000550	....	....	
9, 200	46, 000	.004550	.002550	....	....	
9, 400	47, 000	.006250	.001700	....	....	
9, 600	48, 000	.007100	.000850	....	....	
9, 800	49, 000	.007900	.000800	....	....	
10, 000	50, 000	.009050	.001150	....	....	
10, 400	52, 000	.010900	.001850	....	....	
10, 800	54, 000	.012850	.001950	....	....	
11, 200	56, 000	.015000	.002150	....	....	
11, 600	58, 000	.017050	.002050	....	....	
12, 000	60, 000	.019150	.002100	....	....	
12, 400	62, 000	.021750	.002600	....	....	
12, 800	64, 000	.024500	.002750	....	....	
13, 200	66, 000	.027000	.002500	....	....	
13, 600	68, 000	.030300	.003300	....	....	
14, 000	70, 000	.034150	.003850	....	....	
14, 400	72, 000	.038750	.004600	....	....	
14, 800	74, 000	.043500	.004750	....	....	
15, 200	76, 000	.049500	.006000	....	....	
15, 600	78, 000	.055000	.005500	....	....	
16, 000	80, 000	.062000	.007000	....	....	
16, 400	82, 000	.078750	.011750	....	....	
16, 800	84, 000	.0900	.016250	....	....	
17, 200	86, 000	.1350	.0450	....	....	
17, 240	86, 200	.1550	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	86, 200
Elastic limit per square inch of original section	do	44, 000
Elongation per inch after rupture	inch	0. 2250
Elongation per inch under strain at elastic limit	do	.001450
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		40. 8
Position of rupture		".55 from neck
Character of broken surface		silky
Elongation of inch sections		".13, ".32

No. 3300.

Marks, $\frac{32\,R_{50}\,T}{B\,T,\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000400	.000150	0.	....	
4, 000	20, 000	.000550	.000150	0.	....	
5, 000	25, 000	.000750	.000200	0.	....	
6, 000	30, 000	.000950	.000200	0.	....	
7, 000	35, 000	.001100	.000150	0.	....	
8, 000	40, 000	.001250	.000150	0.	....	
8, 200	41, 000	.001300	.000050	....	....	
8, 400	42, 000	.001300	0.	....	....	
8, 600	43, 000	.001350	.000050	....	....	
8, 800	44, 000	.001400	.000050	....	....	
9, 000	45, 000	.001500	.000100	....	....	Elastic limit.
9, 200	46, 000	.005500	.004000	....	....	
9, 400	47, 000	.006050	.000550	....	....	
9, 600	48, 000	.006950	.000900	....	....	
9, 800	49, 000	.008000	.001050	....	....	
10, 000	50, 000	.008900	.000900	....	....	
10, 400	52, 000	.010850	.001950	....	....	
10, 800	54, 000	.012900	.002050	....	....	
11, 200	56, 000	.015000	.002100	....	....	
11, 600	58, 000	.017000	.002000	....	....	
12, 000	60, 000	.019500	.002500	....	....	
12, 400	62, 000	.022100	.002600	....	....	
12, 800	64, 000	.025000	.002900	....	....	
13, 200	66, 000	.027500	.002500	....	....	
13, 600	68, 000	.031000	.003500	....	....	
14, 000	70, 000	.034750	.003750	....	....	
14, 400	72, 000	.039250	.004500	....	....	
14, 800	74, 000	.044000	.004750	....	....	
15, 200	76, 000	.049000	.005000	....	....	
15, 600	78, 000	.057250	.008250	....	....	
16, 000	80, 000	.064000	.006750	....	....	
16, 400	82, 000	.079750	.015750	....	....	
16, 800	84, 000	.1050	.025250	....	....	
17, 000	85, 000	.1500	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85, 000
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 2500
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40. 3
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.31*, ″.19

No. 3301.

Marks, 32 Rm T
M T, M
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001100	.000200	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	
10,800	54,000	.001850	.000050	....	....	Elastic limit.
11,000	55,000	.005350	.003500	....	....	
11,200	56,000	.006400	.001050	....	....	
11,400	57,000	.008750	.002350	....	....	
11,600	58,000	.009750	.001000	....	....	
11,800	59,000	.010400	.000650	....	....	
12,000	60,000	.011800	.000900	....	....	
12,400	62,000	.013700	.002400	....	....	
12,800	64,000	.016000	.002300	....	....	
13,200	66,000	.018050	.002050	....	....	
13,600	68,000	.019750	.001700	....	....	
14,000	70,000	.022000	.002250	....	....	
14,400	72,000	.024750	.002750	....	....	
14,800	74,000	.027750	.003000	....	....	
15,200	76,000	.031000	.003250	....	....	
15,600	78,000	.033750	.002750	....	....	
16,000	80,000	.037750	.004000	....	....	
16,400	82,000	.042300	.004550	....	....	
16,800	84,000	.047750	.005450	....	....	
17,200	86,000	.054500	.006750	....	....	
17,600	88,000	.063500	.009000	....	....	
18,000	90,000	.0750	.0115	....	....	
18,400	92,000	.1000	.0250	....	....	
18,460	92,300	.1600	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	92,300
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.1750
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		43.8
Position of rupture		".30 from neck
Character of broken surface		silky
Elongation of inch sections		".10, ".25*

No. 3302.

Marks, $\begin{matrix}82\ \text{R}_{m}\ \text{T}\\ \text{M}\ \text{T}_{2}\ \text{M}\end{matrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000900	.000200	0.	....	
6,000	30,000	.001050	.000150	0.	....	
7,000	35,000	.001200	.000150	0.	....	
8,000	40,000	.001400	.000200	0.	....	
9,000	45,000	.001550	.000150	....	....	
10,000	50,000	.001750	.000200	....	....	
10,200	51,000	.001800	.000050	....	....	Elastic limit.
10,400	52,000	.004250	.002450	....	....	
10,600	53,000	.008500	.004250	....	....	
10,800	54,000	.009100	.000600	....	....	
11,000	55,000	.009900	.000800	....	....	
11,200	56,000	.010850	.000950	....	....	
11,400	57,000	.011750	.000900	....	....	
11,600	58,000	.012750	.001000	....	....	
11,800	59,000	.013750	.001000	....	....	
12,000	60,000	.014850	.001100	....	....	
12,400	62,000	.017000	.002150	....	....	
12,800	64,000	.019250	.002250	....	....	
13,200	66,000	.021500	.002250	....	....	
13,600	68,000	.024500	.003000	....	....	
14,000	70,000	.027250	.002750	....	....	
14,400	72,000	.031000	.003750	....	....	
14,800	74,000	.034250	.003250	....	....	
15,200	76,000	.038000	.003750	....	....	
15,600	78,000	.043250	.005250	....	....	
16,000	80,000	.049000	.005750	....	....	
16,400	82,000	.056000	.007000	....	....	
16,800	84,000	.066250	.010250	....	....	
17,200	86,000	.079000	.012750	....	....	
17,600	88,000	.1050	.0260	....	....	
17,830	89,150	.1500	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89,150
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40.3
Position of rupture		″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.30*, ″.12

No. 3462.

Marks, $\overset{32}{M}\ \overset{R_{40}}{T_1}\ \overset{T}{M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	....	....	
2,000	10,000	.000300	.000150	....	....	
3,000	15,000	.000500	.000200	....	....	
4,000	20,000	.000650	.000150	....	....	
5,000	25,000	.000800	.000150	....	....	
6,000	30,000	.000950	.000150	....	....	
7,000	35,000	.001100	.000150	....	....	
8,000	40,000	.001300	.000200	....	....	
8,200	41,000	.001350	.000050	....	....	
8,400	42,000	.001400	.000050	....	....	
8,600	43,000	.001450	.000050	....	....	
8,800	44,000	.001450	0.	....	....	
9,000	45,000	.001500	.000050	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001550	0.	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	Elastic limit.
10,200	51,000	.002250	.000550	....	....	
10,400	52,000	.002700	.000450	....	....	
10,600	53,000	.003100	.000400	....	....	
10,800	54,000	.006500	.003400	....	....	
11,000	55,000	.008500	.002000	....	....	
11,200	56,000	.009500	.001000	....	....	
11,400	57,000	.010500	.001000	....	....	
11,600	58,000	.011250	.000750	....	....	
11,800	59,000	.012300	.001050	....	....	
12,000	60,000	.013100	.000800	....	....	
12,400	62,000	.015550	.002450	....	....	
12,800	64,000	.017700	.002150	....	....	
13,200	66,000	.019900	.002200	....	....	
13,600	68,000	.022350	.002450	....	....	
14,000	70,000	.025100	.002750	....	....	
14,400	72,000	.028500	.003400	....	....	
14,800	74,000	.031600	.003100	....	....	
15,200	76,000	.035250	.003650	....	....	
15,600	78,000	.039600	.004350	....	....	
16,000	80,000	.044900	.005300	....	....	
16,400	82,000	.051500	.006600	....	....	
16,800	84,000	.0575	.0060	....	....	
17,200	86,000	.0650	.0075	....	....	
17,600	88,000	.0900	.0250	....	....	
17,890	89,450	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89,450
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1950
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.40 from neck
Character of broken surface		silky
Elongation of inch sections		″.28*, ″.11

No. 3463.

Marks, $\substack{32\ \text{Rs}\ \text{T}\\ \text{M T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

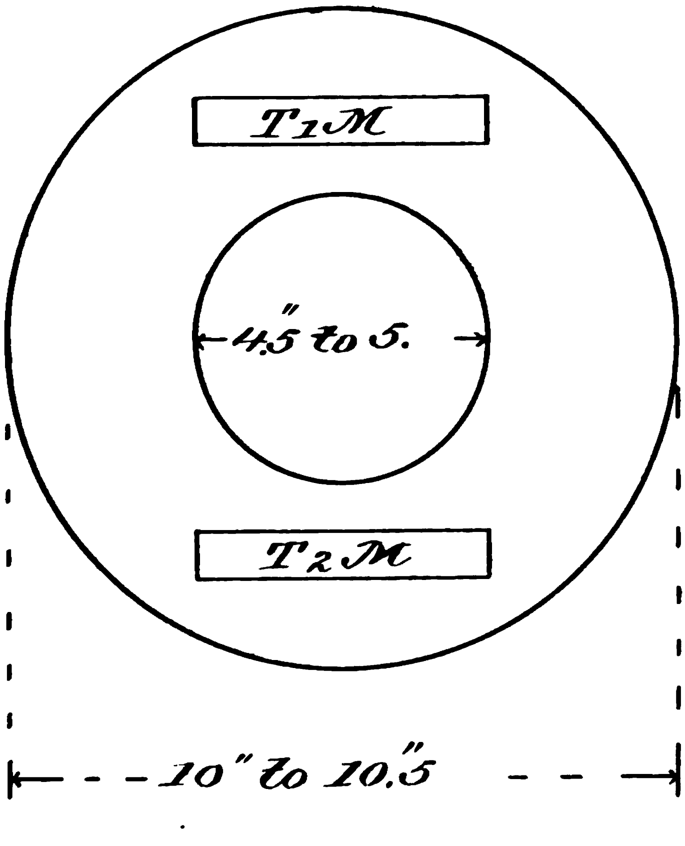
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000400	.000100	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	....	....	
8,000	40,000	.001250	.000150	....	....	
9,000	45,000	.001400	.000150	....	....	
9,200	46,000	.001450	.000050	....	....	
9,400	47,000	.001500	.000050	....	....	
9,600	48,000	.001550	.000050	....	....	
9,800	49,000	.001600	.000050	....	....	Elastic limit.
10,000	50,000	.005550	.003950	....	....	
10,200	51,000	.008050	.002500	....	....	
10,400	52,000	.008750	.000700	....	....	
10,600	53,000	.009800	.001050	....	....	
10,800	54,000	.010900	.001100	....	....	
11,000	55,000	.011850	.000950	....	....	
11,200	56,000	.012850	.001000	....	....	
11,400	57,000	.013900	.001050	....	....	
11,600	58,000	.014900	.001000	....	....	
11,800	59,000	.016050	.001150	....	....	
12,000	60,000	.016750	.000700	....	....	
12,400	62,000	.019850	.003100	....	....	
12,800	64,000	.022550	.002700	....	....	
13,200	66,000	.025350	.002800	....	....	
13,600	68,000	.029000	.003650	....	....	
14,000	70,000	.032100	.003100	....	....	
14,400	72,000	.036250	.004150	....	....	
14,800	74,000	.041050	.004800	....	....	
15,200	76,000	.046750	.005700	....	....	
15,600	78,000	.053500	.006750	....	....	
16,000	80,000	.063250	.009750	....	....	
16,400	82,000	.074350	.011100	....	....	
16,800	84,000	.1000	.025650	....	....	
17,070	85,350	.1450	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	83,350
Elastic limit per square inch of original section	do	49,000
Elongation per inch after rupture	inch	0.2350
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		40.8
Position of rupture		″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.14

3.2 inch steel B.L. Rifles

Jackets



JACKETS FOR 3.2-INCH B. L. RIFLES.

No. 3244.

Marks, $\overset{32\ R_{ss}\ J}{T_1\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000700	.000150	0.	....	
6,000	30,000	.000850	.000150	0.	....	
7,000	35,000	.001000	.000150	0.	....	
8,000	40,000	.001150	.000150	0.	....	
9,000	45,000	.001350	.000200	....	....	
10,000	50,000	.001550	.000200	....	....	Elastic limit.
10,200	51,000	.001700	.000150	....	....	
10,400	52,000	.002250	.000550	....	....	
10,600	53,000	.003700	.001450	....	....	
10,800	54,000	.004750	.001000	....	....	
11,000	55,000	.005600	.000850	....	....	
11,200	56,000	.006500	.000900	....	....	
11,400	57,000	.007400	.000900	....	....	
11,600	58,000	.008250	.000850	....	....	
11,800	59,000	.009300	.001050	....	....	
12,000	60,000	.010250	.000950	....	....	
12,400	62,000	.011950	.001700	....	....	
12,800	64,000	.014200	.002250	....	....	
13,200	66,000	.016000	.001800	....	....	
13,600	68,000	.018200	.002200	....	....	
14,000	70,000	.020500	.002300	....	....	
14,400	72,000	.023000	.002500	....	....	
14,800	74,000	.025600	.002600	....	....	
15,200	76,000	.028750	.003150	....	....	
15,600	78,000	.031200	.002450	....	....	
16,000	80,000	.034500	.003300	....	....	
16,400	82,000	.038250	.003750	....	....	
16,800	84,000	.043100	.004850	....	....	
17,200	86,000	.048500	.005400	....	....	
17,600	88,000	.056250	.007750	....	....	
18,000	90,000	.0750	.008750	....	....	
18,770	93,850	.1250	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93,850
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1650
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.075
Reduction in area after rupture, per centum of original section		27.4
Position of rupture		".65 from neck
Character of broken surface		granular; silky eccentric spot
Elongation of inch sections		".11, ".22

No. 3245.

Marks, $^{32\,\mathrm{R}\,\mathrm{J}}_{\mathrm{T_2\,M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.		
2,000	10,000	.000250	.000150	0.		
3,000	15,000	.000450	.000200	0.		
4,000	20,000	.000600	.000150	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000950	.000200	0.		
7,000	35,000	.001100	.000150	0.		
8,000	40,000	.001250	.000150	0.		
9,000	45,000	.001450	.000200			
9,200	46,000	.001500	.000050			
9,400	47,000	.001550	.000050			
9,600	48,000	.001550	0.			
9,800	49,000	.001650	.000100			Elastic limit.
10,000	50,000	.002450	.000800			
10,200	51,000	.003500	.001050			
10,400	52,000	.004600	.001100			
10,600	53,000	.005500	.000900			
10,800	54,000	.006250	.000750			
11,000	55,000	.007100	.000850			
11,200	56,000	.008150	.001050			
11,400	57,000	.009000	.000850			
11,600	58,000	.009800	.000800			
11,800	59,000	.010550	.000750			
12,000	60,000	.011350	.000800			
12,400	62,000	.013250	.001900			
12,800	64,000	.015500	.002250			
13,200	66,000	.017250	.001750			
13,600	68,000	.019250	.002000			
14,000	70,000	.021400	.002150			
14,400	72,000	.024000	.002600			
14,800	74,000	.026750	.002750			
15,200	76,000	.029750	.003000			
15,600	78,000	.032500	.002750			
16,000	80,000	.035750	.003250			
16,400	82,000	.039800	.004050			
16,800	84,000	.044500	.004700			
17,200	86,000	.050000	.005500			
17,600	88,000	.057500	.007500			
18,000	90,000	.0650	.0075			
18,400	92,000	.0800	.0150			
18,790	93,950	.1250	.0450			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93,950
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1550
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.055
Reduction in area after rupture, per centum of original section		20.5
Position of rupture		″.90 from neck

Character of broken surface, granular; dull spot at circumference. Opened small cracks in the surface of stem.

Elongation of inch sections .... ″.12, ″19

No. 3257.

Marks, $^{32\,\mathrm{R}_{\mathrm{E}}\,\mathrm{J}}_{\mathrm{T}_1\,\mathrm{M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001400	.000100	....	....	
10,000	50,000	.001550	.000150	....	....	
10,200	51,000	.001600	.000050	....	....	Elastic limit not well defined.
10,400	52,000	.001700	.000100	....	....	
10,600	53,000	.001800	.000100	....	....	
10,800	54,000	.001900	.000100	....	....	
11,000	55,000	.002000	.000100	....	....	
11,200	56,000	.002200	.000200	....	....	
11,400	57,000	.002550	.000350	....	....	
11,600	58,000	.003250	.000700	....	....	
11,800	59,000	.004000	.000750	....	....	
12,000	60,000	.004900	.000900	....	....	
12,400	62,000	.006500	.001600	....	....	
12,800	64,000	.008050	.001550	....	....	
13,200	66,000	.009650	.001600	....	....	
13,600	68,000	.011500	.001850	....	....	
14,000	70,000	.013350	.001850	....	....	
14,400	72,000	.015100	.001750	....	....	
14,800	74,000	.016750	.001650	....	....	
15,200	76,000	.018600	.001850	....	....	
15,600	78,000	.020500	.001900	....	....	
16,000	80,000	.022750	.002250	....	....	
16,400	82,000	.025500	.002750	....	....	
16,800	84,000	.027750	.002250	....	....	
17,200	86,000	.031250	.003500	....	....	
17,600	88,000	.034250	.003000	....	....	
18,000	90,000	.037000	.002750	....	....	
18,400	92,000	.040600	.003600	....	....	
18,800	94,000	.045000	.004400	....	....	
19,200	96,000	.050000	.005000	....	....	
19,600	98,000	.057500	.007500	....	....	
20,000	100,000	.0650	.0075	....	....	
20,400	102,000	.0850	.0200	....	....	
20,480	102,400	.1200	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102,400
Elastic limit per square inch of original section not well defined	do....	51,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.065
Reduction in area after rupture, per centum of original section		23.9
Position of rupture		".65 from neck
Character of broken surface		granular; dull spot at the circumference
Elongation of inch sections		".20*, ".10

No. 3258.

Marks, $^{32\ R_{87}\ J}_{T_2\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001100	.000200	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001550	.000150	....	....	
10,200	51,000	.001650	.000100	....	....	
10,400	52,000	.001750	.000100	....	....	
10,600	53,000	.001800	.000050	....	....	
10,800	54,000	.001800	0.	....	....	
11,000	55,000	.001850	.000050	....	....	
11,200	56,000	.001900	.000050	....	....	Elastic limit.
11,400	57,000	.002050	.000150	....	....	
11,600	58,000	.002600	.000550	....	....	
11,800	59,000	.003750	.000150	....	....	
12,000	60,000	.005000	.001250	....	....	
12,400	62,000	.007400	.002400	....	....	
12,800	64,000	.009000	.001600	....	....	
13,200	66,000	.010400	.001400	....	....	
13,600	68,000	.012250	.001850	....	....	
14,000	70,000	.013900	.001650	....	....	
14,400	72,000	.015750	.001850	....	....	
14,800	74,000	.017250	.001500	....	....	
15,200	76,000	.020000	.002750	....	....	
15,600	78,000	.022500	.002500	....	....	
16,000	80,000	.024500	.002000	....	....	
16,400	82,000	.026800	.002300	....	....	
16,800	84,000	.029200	.002400	....	....	
17,200	86,000	.032000	.002800	....	....	
17,600	88,000	.035750	.003750	....	....	
18,000	90,000	.039750	.004000	....	....	
18,400	92,000	.044500	.004750	....	....	
18,800	94,000	.050850	.006350	....	....	
19,200	96,000	.056750	.005900	....	....	
19,600	98,000	.0650	.008250	....	....	
20,000	100,000	.0850	.0200	....	....	
20,200	101,000	.1100	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	101,000
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.065
Reduction in area after rupture, per centum of original section		23.9
Position of rupture		1″.05 from neck

Character of broken surface, granular, radiating from a dull spot in the circumference. Opened cracks in surface of stem.

Elongation of inch sections .... ″.13, ″.17*

No. 3476.

Marks, $^{32}\mathrm{R}^{\mathrm{J}}_{\mathrm{T_3 M}}$
Diameter, ''.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000700	.000150	0.	....	
6,000	30,000	.000900	.000200	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001200	.000150	0.	....	
9,000	45,000	.001400	.000200	....	....	
9,200	46,000	.001500	.000100	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001700	0.	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	Elastic limit.
10,800	54,000	.001950	.000150	....	....	
11,000	55,000	.003100	.001550	....	....	
11,200	56,000	.004350	.000950	....	....	
11,400	57,000	.005250	.000900	....	....	
11,600	58,000	.006400	.001150	....	....	
11,800	59,000	.006900	.000500	....	....	
12,000	60,000	.007850	.000950	....	....	
12,400	62,000	.009250	.001400	....	....	
12,800	64 000	.011000	.001750	....	....	
13,200	66,000	.012550	.001550	....	....	
13,600	68,000	.014500	.001950	....	....	
14,000	70,000	.017250	.002750	....	....	
14,400	72,000	.019000	.001750	....	....	
14,800	74,000	.020500	.001500	....	....	
15,200	76,000	.022500	.002000	....	....	
15,600	78,000	.023600	.001100	....	....	
16,000	80,000	.026650	.003050	....	....	
16,400	82,000	.029500	.002850	....	....	
16,800	84,000	.032650	.003150	....	....	
17,200	86,000	.035850	.003200	....	....	
17,600	88,000	.039650	.003800	....	....	
18,000	90,000	.044500	.004850	....	....	
18,400	92,000	.050000	.005500	....	....	
18,800	94,000	.056750	.006750	....	....	
19,200	96,000	.068000	.011250	....	....	
19,600	98,000	.0800	.0120	....	....	
19,910	99,550	.1300	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	99,550
Elastic limit per square inch of original section	do ...	53,000
Elongation per inch after rupture	inch..	0.1550
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.045
Reduction in area after rupture, per centum of original section		16.9
Position of rupture		''.70 from neck

Character of broken surface, granular; dull spot at the circumference. Opened cracks in surface of stem.

Elongation of inch sections ....''.15, ''.16*

No. 3477.

Marks, $^{32\,\text{R}_{77}\,\text{J}}_{\text{T}_4\,\text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000350	.000100	0.	....	
4, 000	20, 000	.000500	.000150	0.	....	
5, 000	25, 000	.000700	.000200	0.	....	
6, 000	30, 000	.000900	.000200	0.	....	
7, 000	35, 000	.001050	.000150	0.	....	
8, 000	40, 000	.001250	.000200	0.	....	
9, 000	45, 000	.001400	.000150	....	....	
10, 000	50, 000	.001650	.000250	....	....	
10, 200	51, 000	.001650	0.	....	....	
10, 400	52, 000	.001700	.000050	....	....	
10, 600	53, 000	.001750	.000050	....	....	
10, 800	54, 000	.001800	.000050	....	....	
11, 000	55, 000	.001900	.000100	....	....	Elastic limit.
11, 200	56, 000	.002100	.000200	....	....	
11, 400	57, 000	.002700	.000600	....	....	
11, 600	58, 000	.003850	.001150	....	....	
11, 800	59, 000	.004850	.001000	....	....	
12, 000	60, 000	.005650	.000800	....	....	
12, 400	62, 000	.007250	.001600	....	....	
12, 800	64, 000	.009000	.001750	....	....	
13, 200	66, 000	.010650	.001650	....	....	
13, 600	68, 000	.012100	.001450	....	....	
14, 000	70, 000	.014000	.001900	....	....	
14, 400	72, 000	.015050	.001050	....	....	
14, 800	74, 000	.017500	.002450	....	....	
15, 200	76, 000	.019150	.001650	....	....	
15, 600	78, 000	.021250	.002100	....	....	
16, 000	80, 000	.024000	.002750	....	....	
16, 400	82, 000	.026250	.002250	....	....	
16, 800	84, 000	.028750	.002500	....	....	
17, 200	86, 000	.031250	.002500	....	....	
17, 600	88, 000	.033750	.002500	....	....	
18, 000	90, 000	.037500	.003750	....	....	
18, 400	92, 000	.041350	.003850	....	....	
18, 800	94, 000	.046150	.004800	....	....	
19, 200	96, 000	.051750	.005600	....	....	
19, 600	98, 000	.059250	.007500	....	....	
20, 000	100, 000	.0630	.005750	....	....	
20, 400	102, 000	.0850	.0200	....	....	
20, 580	102, 900	.1650	.0800	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102, 900
Elastic limit per square inch of original section	do	55, 000
Elongation per inch after rupture	inch..	0. 2200
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point o rupture	do....	.065
Reduction in area after rupture, per centum of original section		23. 9
Position of rupture		″.75
Character of broken surface		granular; dull, flaky line of metal
Elongation of inch sections		″.21, ″.23*

No. 3246.

Marks, $^{32\,R_{8}\,J}_{\;T_1\,M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001550	.000200	....	....	
9,200	46,000	.001600	.000050	....	....	
9,400	47,000	.001650	.000050	....	....	
9,600	48,000	.001700	.000050	....	....	
9,800	49. 000	.001750	.000050	....	....	Elastic limit.
10,000	50,000	.002000	.000250	....	....	
10,200	51,000	.002500	.000500	....	....	
10,400	52,000	.003200	.000700	....	....	
10,600	53,000	.004000	.000800	....	....	
10,800	54,000	.004750	.000750	....	....	
11,000	55,000	.005250	.000500	....	....	
11,200	56,000	.005000	.000750	....	....	
11,400	57,000	.006550	.000650	....	....	
11,600	58,000	.007250	.000700	....	....	
11,800	59,000	.007850	.000600	....	....	
12,000	60,000	.008600	.000750	....	....	
12,400	62,000	.010250	.001650	....	....	
12,800	64,000	.011750	.001500	....	....	
13,200	66,000	.013500	.001750	....	....	
13,600	68,000	.015000	.001500	....	....	
14,000	70,000	.016550	.001550	....	....	
14,400	72,000	.018250	.001700	....	....	
14,800	74,000	.020250	.002000	....	....	
15,200	76,000	.022100	.001850	....	....	
15,600	78,000	.024500	.002400	....	....	
16,000	80,000	.026550	.002050	....	....	
16,400	82,000	.029050	.002500	....	....	
16,800	84,000	.032350	.003300	....	....	
17,200	86,000	.035100	.002750	....	....	
17,600	88,000	.037900	.002800	....	....	
18,000	90,000	.041750	.003850	....	....	
18,400	92,000	.046250	.004500	....	....	
18,800	94,000	.051500	.005250	....	....	
19,200	96,000	.0550	.0035	....	....	
19,600	98,000	.0600	.0050	....	....	
20,000	100,000	.0800	.0200	....	....	
20,400	102,000	.1200	0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102,000
Elastic limit per square inch of original section	do ...	49,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		".80 from neck
Character of broken surface		silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		".12, ".26*

No. 3247.

Marks, $^{32\ Rss}_{T_3\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001250	.000250	0.	....	
8,000	40,000	.001400	.000150	0.	....	
9,000	45,000	.001550	.000150	....	....	
9,200	46,000	.001650	000100	....	....	
9,400	47,000	.001700	.000050	....	....	
9,600	48,000	.001750	.000050	....	....	
9,800	49,000	.001750	0.	....	....	
10,000	50,000	.001800	.000050	....	....	
10,200	51,000	.001850	.000050	....	....	
10,400	52,000	.001900	.000050	....	....	Elastic limit.
10,600	53,000	.002050	.000150	....	....	
10,800	54,000	.002400	.000350	....	....	
11,000	55,000	.003000	.000600	....	....	
11,200	56,000	.003400	.000400	....	....	
11,400	57,000	.003750	.000350	....	....	
11,600	58,000	.004200	.000450	....	....	
11,800	59,000	.005000	.000800	....	....	
12,000	60,000	.005600	.000600	....	....	
12,400	62,000	.007550	.001950	....	....	
12,800	64,000	.008250	.000700	....	....	
13,200	66,000	.009350	.001100	....	....	
13,600	68,000	.011000	.001650	....	....	
14,000	70,000	.012650	.001650	....	....	
14,400	72,000	.014250	.001600	....	....	
14,800	74,000	.016000	.001750	....	....	
15,200	76,000	.017600	.001600	....	....	
15,600	78,000	.019750	.002150	....	....	
16,000	80,000	.021800	.002050	....	....	
16,400	82,000	.023500	.001700	....	....	
16,800	84,000	.025650	.002150	....	....	
17,200	86,000	.028250	.002600	....	....	
17,600	88,000	.030600	.002350	....	....	
18,000	90,000	.033250	.002650	....	....	
18,400	92,000	.036500	.003250	....	....	
18,800	94,000	.039500	.003000	....	....	
19,200	96,000	.043000	.003500	....	....	
19,600	98,000	.048000	.005000	....	....	
20,000	100,000	.053400	.005400	....	....	
20,400	102,000	.0575	.0041	....	....	
20,800	104,000	.0650	.0075	....	....	
21 200	106,000	.0900	.0250	....	....	
21,380	106,900	.1150	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	106,900
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1600
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.075
Reduction in area after rupture, per centum of original section		27.4
Position of rupture		″.70 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		″.11, ″.21*

No. 3259.

Marks, $^{82\ B.\ J}_{T,\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000600	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	Elastic limit.
10,400	52,000	.001850	.000150	....	....	
10,600	53,000	.002000	.000150	....	....	
10,800	54,000	.002450	.000450	....	....	
11,000	55,000	.003100	.000650	....	....	
11,200	56,000	.004000	.000900	....	....	
11,400	57,000	.005500	.001500	....	....	
11,600	58,000	.006400	.000900	....	....	
11,800	59,000	.007100	.000700	....	....	
12,000	60,000	.007900	.000800	....	....	
12,400	62,000	.009100	.001200	....	....	
12,800	64,000	.010250	.001150	....	....	
13,200	66,000	.011550	.001300	....	....	
13,600	68,000	.013350	.001800	....	....	
14,000	70,000	.015250	.001900	....	....	
14,400	72,000	.017350	.002100	....	....	
14,800	74,000	.019000	.001650	....	....	
15,200	76,000	.021050	.002050	....	....	
15,600	78,000	.022900	.001850	....	....	
16,000	80,000	.025250	.002350	....	....	
16,400	82,000	.027050	.001800	....	....	
16,800	84,000	.029300	.002250	....	....	
17,200	86,000	.031750	.002450	....	....	
17,600	88,000	.035250	.003500	....	....	
18,000	90,000	.038300	.003050	....	....	
18,400	92,000	.042500	.004200	....	....	
18,800	94,000	.047250	.004750	....	....	
19,200	96,000	.052500	.005250	....	....	
19,600	98,000	.057500	.005000	....	....	
20,000	100,000	.0650	.0075	....	....	
20,400	102,000	.0800	.0150	....	....	
20,800	104,000	.1050	.0250	....	....	
20,820	104,100	.1300	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104,106
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		".70 from neck
Character of broken surface		granular, 50 per cent.; silky, 50 per cent.
Elongation of inch sections		".11, ".25*

No. 3314.

Marks, $\genfrac{}{}{0pt}{}{32\ R_{30}\ J}{T_2\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000350	.000200	0.		
3,000	15,000	.000550	.000200	0.		
4,000	20,000	.000700	.000150	0.		
5,000	25,000	.000900	.000200	0.		
6,000	30,000	.001100	.000200	0.		
7,000	35,000	.001250	.000150	0.		
8,000	40,000	.001400	.000150	.000050	.000050	
9,000	45,000	.001600	.000200			
9,200	46,000	.001650	.000050			
9,400	47,000	.001700	.000050			
9,600	48,000	.001750	.000050			
9,800	49,000	.001800	.000050			Elastic limit.
10,000	50,000	.002050	.000250			
10,200	51,000	.003300	.001250			
10,400	52,000	.004500	.001200			
10,600	53,000	.005350	.000850			
10,800	54,000	.006100	.000750			
11,000	55,000	.006900	.000800			
11,200	56,000	.007600	.000700			
11,400	57,000	.008500	.000900			
11,600	58,000	.009250	.000750			
11,800	59,000	.010000	.000750			
12,000	60,000	.010750	.000750			
12,400	62,000	.012750	.002000			
12,800	64,000	.014900	.002150			
13,200	66,000	.016500	.001600			
13,600	68,000	.018250	.001750			
14,000	70,000	.020100	.001850			
14,400	72,000	.022750	.002650			
14,800	74,000	.024900	.002150			
15,200	76,000	.027250	.002350			
15,600	78,000	.030750	.003500			
16,000	80,000	.034900	.004150			
16,400	82,000	.036900	.002000			
16,800	84,000	.040500	.003600			
17,200	86,000	.044850	.004350			
17,600	88,000	.0500	.005150			
18,000	90,000	.0600	.0100			
18,400	92,000	.0700	.0100			
18,800	94,000	.0850	.0150			
19,180	95,900	.1200	.0350			Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 95,900
Elastic limit per square inch of original section ....do.... 49,000
Elongation per inch after rupture ....inch.. 0.1850
Elongation per inch under strain at elastic limit ....do.... .001800
Reduction in diameter at point of rupture ....do.... .085
Reduction in area after rupture, per centum of original section 30.7
Position of rupture ....″.85 from neck
Character of broken surface, granular; silky spot at the circumference. Opened cracks in surface of stem.
Elongation of inch sections ....″.25*, ″.12

No. 3181.

Marks, $^{32\,\mathrm{B_n}\,\mathrm{J}}_{\mathrm{T,\,M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	—.000050	—.000050	
9,000	45,000	.001500	.000200	....	....	
10,000	50,000	.001700	.000200	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	
10,600	53,000	.001900	.000100	....	....	Elastic limit.
10,800	54,000	.002150	.000250	....	....	
11,000	55,000	.002800	.000650	....	....	
11,200	56,000	.003600	.000800	....	....	
11,400	57,000	.004350	.000750	....	....	
11,600	58,000	.005250	.000900	....	....	
11,800	59,000	.006100	.000850	....	....	
12,000	60,000	.006900	.000800	....	....	
12,400	62,000	.008600	.001700	....	....	
12,800	64,000	.010050	.001450	....	....	
13,200	66,000	.012050	.002000	....	....	
13,600	68,000	.013750	.001700	....	....	
14,000	70,000	.015600	.001850	....	....	
14,400	72,000	.017350	.001750	....	....	
14,800	74,000	.019500	.002150	....	....	
15,200	76,000	.021250	.001750	....	....	
15,600	78,000	.023700	.002450	....	....	
16,000	80,000	.026050	.002350	....	....	
16,400	82,000	.028800	.002750	....	....	
16,800	84,000	.031600	.002800	....	....	
17,200	86,000	.034600	.003000	....	....	
17,600	88,000	.038250	.003650	....	....	
18,000	90,000	.042750	.004500	....	....	
18,400	92,000	.047800	.005050	....	....	
18,800	94,000	.055000	.007200	....	....	
19,200	96,000	.062500	.007500	....	....	
19,600	98,000	.0700	.0075	....	....	
20,000	100,000	.1000	.0300	....	....	
20,070	100,350	.1200	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,350
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1960
Elongation per inch under strain at elastic limit	do ...	.001900
Reduction in diameter at point of rupture	do ...	.065
Reduction in area after rupture, per centum of original section		23.9
Position of rupture		1″ from neck

Character of broken surface, granular; radiating from a silky spot at the circumference. Opened cracks in surface of stem.

Elongation of inch sections .... ″.17, ″.21

No. 3182.

Marks, $^{32}\,{}^{\mathrm{R_H\ J}}_{\mathrm{T_2\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000400	.000250	0.	....	
3,000	15,000	.000600	.000200	0.	....	
4,000	20,000	.000800	.000200	0.	....	
5,000	25,000	.000950	.000150	0.	....	
6,000	30,000	.001150	.000200	0.	....	
7,000	35,000	.001350	.000200	0.	....	
8,000	40,000	.001500	.000150	0.	....	
9,000	45,000	.001650	.000150	....	....	
10,000	50,000	.001850	.000200	....	....	
10,200	51,000	.001900	.000050	....	....	
10,400	52,000	.001900	0.	....	....	
10,600	53,000	.002000	.000100	....	....	Elastic limit.
10,800	54,000	.002150	.000150	....	....	
11,000	55,000	.002450	.000300	....	....	
11,200	56,000	.002750	.000300	....	....	
11,400	57,000	.003100	.000350	....	....	
11,600	58,000	.003750	.000650	....	....	
11,800	59,000	.004750	.001000	....	....	
12,000	60,000	.005750	.001000	....	....	
12,400	62,000	.007050	.001300	....	....	
12,800	64,000	.008750	.001700	....	....	
13,200	66,000	.010000	.001250	....	....	
13,600	68,000	.011600	.001600	....	....	
14,000	70,000	.013500	.001900	....	....	
14,400	72,000	.015500	.002000	....	....	
14,800	74,000	.017250	.001750	....	....	
15,200	76,000	.019000	.001750	....	....	
15,600	78,000	.020600	.001600	....	....	
16,000	80,000	.022550	.001950	....	....	
16,400	82,000	.025150	.002600	....	....	
16,800	84,000	.027600	.002450	....	....	
17,200	86,000	.030200	.002600	....	....	
17,600	88,000	.033000	.002800	....	....	
18,000	90,000	.036500	.003500	....	....	
18,400	92,000	.041050	.004550	....	....	
18,800	94,000	.046750	.005700	....	....	
19,200	96,000	.051000	.004250	....	....	
19,600	98,000	.056250	.005250	....	....	
20,000	100,000	.0625	.006250	....	....	
20,400	102,000	.0750	.0125	....	....	
20,670	103,350	.1050	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	103,350
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1700
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.085
Reduction in area after rupture, per centum of original section		30.7
Position of rupture		″.95 from neck
Character of broken surface		granular, silky eccentric spot
Elongation of inch sections		″.12, ″.22*

No. 3248.

Marks, $^{32\,\mathrm{R_a}\,\mathrm{J}}_{\mathrm{T_1\,M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	
10,800	54,000	.001900	.000100	....	....	
11,000	55,000	.001950	.000050	....	....	Elastic limit.
11,200	56,000	.002100	.000150	....	....	
11,400	57,000	.002400	.000300	....	....	
11,600	58,000	.003000	.000600	....	....	
11,800	59,000	.003700	.000700	....	....	
12,000	60,000	.004550	.000850	....	....	
12,400	62,000	.006500	.001950	....	....	
12,800	64,000	.008150	.001650	....	....	
13,200	66,000	.009550	.001400	....	....	
13,600	68,000	.011350	.001800	....	....	
14,000	70,000	.013250	.001900	....	....	
14,400	72,000	.015250	.002000	....	....	
14,800	74,000	.016800	.001550	....	....	
15,200	76,000	.018550	.001750	....	....	
15,600	78,000	.020350	.001800	....	....	
16,000	80,000	.022550	.002200	....	....	
16,400	82,000	.024750	.002200	....	....	
16,800	84,000	.027250	.002500	....	....	
17,200	86,000	.030000	.002750	....	....	
17,600	88,000	.032600	.002600	....	....	
18,000	90,000	.035850	.003250	....	....	
18,400	92,000	.040000	.004150	....	....	
18,800	94,000	.044500	.004500	....	....	
19,200	96,000	.049250	.004750	....	....	
19,600	98,000	.058600	.009350	....	....	
20,000	100,000	.0625	.0039	....	....	
20,400	102,000	.0800	.0175	....	....	
20,760	103,800	.1200	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.......pounds..	103,800
Elastic limit per square inch of original section.......do....	55,000
Elongation per inch after rupture.......inch..	0.1450
Elongation per inch under strain at elastic limit.......do....	.001950
Reduction in diameter at point of rupture.......do....	.065
Reduction in area after rupture, per centum of original section.......	28.9
Position of rupture.......	".35 from neck
Character of broken surface.......	granular; dull flaky spot near circumference
Elongation of inch sections.......	".17", ".12

No. 3249.

Marks, ${}^{32\ \text{B J}}_{\quad\text{T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001500	.000150	....	....	
10,000	50,000	.001700	.000200	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001850	.000100	....	....	
10,600	53,000	.001900	.000050	....	....	
10,800	54,000	.001950	.000050	....	....	Elastic limit.
11,000	55,000	.002100	.000150	....	....	
11,200	56,000	.002450	.000350	....	....	
11,400	57,000	.003050	.000600	....	....	
11,600	58,000	.003650	.000600	....	....	
11,800	59,000	.004500	.000850	....	....	
12,000	60,000	.005400	.000900	....	....	
12,400	62,000	.007100	.001700	....	....	
12,800	64,000	.008800	.001700	....	....	
13,200	66,000	.010250	.001450	....	....	
13,600	68,000	.012000	.001750	....	....	
14,000	70,000	.013500	.001500	....	....	
14,400	72,000	.015400	.001900	....	....	
14,800	74,000	.017400	.002000	....	....	
15,200	76,000	.019250	.001850	....	....	
15,600	78,000	.021100	.001850	....	....	
16,000	80,000	.023250	.002150	....	....	
16,400	82,000	.025600	.002350	....	....	
16,800	84,000	.028250	.002650	....	....	
17,200	86,000	.030850	.002600	....	....	
17,600	88,000	.034000	.003150	....	....	
18,000	90,000	.037100	.003100	....	....	
18,400	92,000	.041250	.004150	....	....	
18,800	94,000	.046500	.005250	....	....	
19,200	96,000	.052000	.005500	....	....	
19,600	98,000	.059150	.007150	....	....	
20,000	100,000	.0650	.005850	....	....	
20,400	102,000	.0900	.0250	....	....	
20,470	102,350	.1100	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	102,350
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.1600
Elongation per inch under strain at elastic limit	do	.001950
Reduction in diameter at point of rupture	do	.105
Reduction in area after rupture, per centum of original section		37.1
Position of rupture		″.80 from neck
Character of broken surface		granular, silky spot at circumference
Elongation of inch sections		″.22*, ″.10

No. 3250.

Marks, $\overset{22\ R,\ J}{T,\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001750	.000100	....	....	
10,400	52,000	.001800	.000050	....	....	
10,600	53,000	.001900	.000100	....	....	
10,800	54,000	.002000	.000100	....	....	Elastic limit.
11,000	55,000	.002200	.000200	....	....	
11,200	56,000	.002900	.000700	....	....	
11,400	57,000	.003750	.000850	....	....	
11,600	58,000	.004500	.000750	....	....	
11,800	59,000	.005250	.000750	....	....	
12,000	60,000	.005850	.000600	....	....	
12,400	62,000	.007800	.001950	....	....	
12,800	64,000	.009350	.001550	....	....	
13,200	66,000	.010850	.001500	....	....	
13,600	68,000	.012600	.001750	....	....	
14,000	70,000	.014600	.002000	....	....	
14,400	72,000	.016500	.001900	....	....	
14,800	74,000	.018100	.001600	....	....	
15,200	76,000	.020250	.002150	....	....	
15,600	78,000	.022150	.001900	....	....	
16,000	80,000	.024500	.002350	....	....	
16,400	82,000	.027000	.002500	....	....	
16,800	84,000	.029800	.002800	....	....	
17,200	86,000	.032600	.002800	....	....	
17,600	88,000	.035500	.002900	....	....	
18,000	90,000	.038750	.003250	....	....	
18,400	92,000	.043000	.004250	....	....	
18,800	94,000	.047550	.004550	....	....	
19,200	96,000	.054350	.006800	....	....	
19,600	98,000	.0600	.005650	....	....	
20,000	100,000	.0800	.0200	....	....	
20,380	101,900	.1350	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....pounds..	101,900
Elastic limit per square inch of original section....do ...	54,000
Elongation per inch after rupture....inch..	0.1850
Elongation per inch under strain at elastic limit....do....	.002000
Reduction in diameter at point of rupture....do ...	.085
Reduction in area after rupture, per centum of original section....	30.7
Position of rupture....	".95 from neck
Character of broken surface....	silky center; granular at the circumference
Elongation of inch sections....	".25*, ".12

No. 3251.

Marks, $^{32}\,{}^{R_a\,J}_{T_2\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000350	.000200	0.		
3,000	15,000	.000550	000200	0.		
4,000	20,000	.000750	.000200	0.		
5,000	25,000	.000900	.000150	0.		
6,000	30,000	.001050	.000150	0.		
7,000	35,000	.001250	.000200	0.		
8,000	40,000	.001400	.000150	0.		
9,000	45,000	.001550	.000150			
10,000	50,000	.001700	.000150			
10,200	51,000	.001750	.000050			
10,400	52,000	.001800	.000050			Elastic limit.
10,600	53,000	.001950	.000150			
10,800	54,000	.002100	.000150			
11,000	55,000	.002650	.000550			
11,200	56,000	.003400	.000750			
11,400	57,000	.004150	.000750			
11,600	58,000	.005000	.000850			
11,800	59,000	.005800	.000800			
12,000	60,000	.006750	.000950			
12,400	62,000	.008250	.001500			
12,800	64,000	.009850	.001600			
13,200	66,000	.011350	.001500			
13,600	68,000	.013100	.001750			
14,000	70,000	.015050	.001950			
14,400	72,000	.016750	.001700			
14,800	74,000	.018500	.001750			
15,200	76,000	.020350	.001850			
15,600	78,000	.023000	.002650			
16,000	80,000	.025100	.002100			
16,400	82,000	.027600	.002500			
16,800	84,000	.030850	.002750			
17,200	86,000	.033400	.003050			
17,600	88,000	.036350	.002950			
18,000	90,000	.040750	.004400			
18,400	92,000	.045250	.004500			
18,800	94,000	.051250	.006000			
19,200	96,000	.058000	.006750			
19,600	98,000	.0650	.0070			
20,000	100,000	.0850	.0200			
20,190	100,950					Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,950
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1050
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.035
Reduction in area after rupture, per centum of original section		13.2
Position of rupture		″.55 from neck
Character of broken surface		granular; radiating from a flaky spot at circumference
Elongation of inch sections		″.12*, ″.09

No. 3183.

Marks, $\overset{32\ \text{Rx J}}{\text{T}_1\ \text{M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001150	.000200	....	....	
8,000	40,000	.001300	.000150	....	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001600	.000150	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001750	.000100	....	....	
10,600	53 000	.001800	.000050	....	....	
10,800	54,000	.001800	0.	....	....	Elastic limit.
11,000	55,000	.001950	.000150	....	....	
11,200	56,000	.002300	.000350	....	....	
11,400	57,000	.002700	.000400	....	....	
11,600	58,000	.003500	.000800	....	....	
11,800	59,000	.004250	.000750	....	....	
12,000	60,000	.004900	.000650	....	....	
12,400	62,000	.006550	.001750	....	....	
12,800	64,000	.008100	.001550	....	....	
13,200	66,000	.009550	.001450	....	....	
13,600	68,000	.011100	.001550	....	....	
14,000	70,000	.012700	.001600	....	....	
14,400	72,000	.014500	.001800	....	....	
14,800	74,000	.016100	.001600	....	....	
15,200	76,000	.017850	.001750	....	....	
15,600	78,000	.019850	.002000	....	....	
16,000	80,000	.021750	.001900	....	....	
16,400	82,000	.024000	.002250	....	....	
16,800	84,000	.026250	.002250	....	....	
17,200	86,000	.028750	.002500	....	....	
17,600	88,000	.031550	.002800	....	....	
18,000	90,000	.034350	.002800	....	....	
18,400	92,000	.037800	.003450	....	....	
18,800	94,000	.041250	.003450	....	....	
19,200	96,000	.046350	.005100	....	....	
19,600	98,000	.0500	.003650	....	....	
20,000	100,000	.0550	.0050	....	....	
20,400	102,000	.0650	.0100	....	....	
20,800	104,000	.0850	.0200	....	....	
20,890	104,450	.1050	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104,450
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.1600
Elongation per inch under strain at elastic limit	do ...	.001800
Reduction in diameter at point of rupture	do....	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		".45 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		".09, ".23*

No. 3184.

Marks, $\genfrac{}{}{0pt}{}{32\ R_{24}\ J}{T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001750	.000100	....	....	
10,400	52,000	.001800	.000050	....	....	Elastic limit.
10,600	53,000	.002050	.000250	....	....	
10,800	54,000	.002800	.000750	....	....	
11,000	55,000	.003650	.000850	....	....	
11,200	56,000	.004450	.000800	....	....	
11,400	57,000	.005450	.001000	....	....	
11,600	58,000	.006300	.000850	....	....	
11,800	59,000	.007000	.000700	....	....	
12,000	60,000	.007750	.000750	....	....	
12,400	62,000	.009900	.002150	....	....	
12,800	64,000	.011400	.001500	....	....	
13,200	66,000	.013150	.001750	....	....	
13,600	68,000	.015000	.001850	....	....	
14,000	70,000	.016850	.001850	....	....	
14,400	72,000	.018750	.001900	....	....	
14,800	74,000	.020800	.002050	....	....	
15,200	76,000	.022700	.001900	....	....	
15,600	78,000	.025100	.002400	....	....	
16,000	80,000	.027550	.002450	....	....	
16,400	82,000	.030750	.003200	....	....	
16,800	84,000	.033600	.002850	....	....	
17,200	86,000	.036500	.002900	....	....	
17,600	88,000	.040500	.004000	....	....	
18,000	90,000	.045250	.004750	....	....	
18,400	92,000	.051000	.006750	....	....	
18,800	94,000	.0550	.0040	....	....	
19,200	96,000	.0600	.0050	....	....	
19,600	98,000	.0800	.0200	....	....	
19,860	99,300	.1200	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	99,300
Elastic limit per square inch of original section	do	52,000
Elongation per inch after rupture	inch	0.2300
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		40.3
Position of rupture		1″.05 from neck
Character of broken surface		silky, trace of granulation
Elongation of inch sections		″.28*, ″.18

No. 3185.

Marks, $\overset{32\ B\ J}{T,\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	—.000050	—.000050	
2,000	10,000	.000300	.000150	—.000050	0.	
3,000	15,000	.000400	.000100	—.000050	0.	
4,000	20,000	.000600	.000200	—.000050	0.	
5,000	25,000	.000700	.000100	—.000050	0.	
6,000	30,000	.000850	.000150	—.000050	0.	
7,000	35,000	.001000	.000150	—.000050	0.	
8,000	40,000	.001150	.000150	—.000050	0.	
9,000	45,000	.001300	.000150	....	....	
10,000	50,000	.001450	.000150	....	....	
10,200	51,000	.001500	.000050	....	....	Elastic limit.
10,400	52,000	.001650	.000150	....	....	
10,600	53,000	.001750	.000100	....	....	
10,800	54,000	.002100	.000350	....	....	
11,000	55,000	.002950	.000850	....	....	
11,200	56,000	.003700	.000750	....	....	
11,400	57,000	.004500	.000800	....	....	
11,600	58,000	.005250	.000750	....	....	
11,800	59,000	.006000	.000750	....	....	
12,000	60,000	.006850	.000850	....	....	
12,400	62,000	.008250	.001400	....	....	
12,800	64,000	.009750	.001500	....	....	
13,200	66,000	.011100	.001350	....	....	
13,600	68,000	.012850	.001750	....	....	
14,000	70,000	.014500	.001650	....	....	
14,400	72,000	.016100	.001600	....	....	
14,800	74,000	.017750	.001650	....	....	
15,200	76,000	.019500	.001750	....	....	
15,600	78,000	.021600	.002100	....	....	
16,000	80,000	.023750	.002150	....	....	
16,400	82,000	.025750	.002000	....	....	
16,800	84,000	.028250	.002500	....	....	
17,200	86,000	.031000	.002750	....	....	
17,600	88,000	.033750	.002750	....	....	
18,000	90,000	.037000	.003250	....	....	
18,400	92,000	.040750	.003750	....	....	
18,800	94,000	.044500	.003750	....	....	
19,200	96,000	.050250	.005750	....	....	
19,600	98,000	.056500	.006250	....	....	
20,000	100,000	.0625	.0060	....	....	
20,400	102,000	.0800	.0175	....	....	
20,800	104,000	.1150	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104,000
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do ...	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		".60 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		".10, ".26*

No. 3186.

Marks, $^{32}\frac{\text{R. J}}{\text{T, M}}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001200	.000150	0.	....	
9,000	45,000	.001350	.000150	....	....	
10,000	50,000	.001550	.000200	....	....	
10,200	51,000	.001600	.000050	....	....	
10,400	52,000	.001650	.000050	....	....	Elastic limit.
10,600	53,000	.001850	.000200	....	....	
10,800	54,000	.002250	.000400	....	....	
11,000	55,000	.002900	.000650	....	....	
11,200	56,000	.003900	.001000	....	....	
11,400	57,000	.004600	.000700	....	....	
11,600	58,000	.005300	.000700	....	....	
11,800	59,000	.006050	.000750	....	....	
12,000	60,000	.006900	.000850	....	....	
12,400	62,000	.008400	.001500	....	....	
12,800	64,000	.009850	.001450	....	....	
13,200	66,000	.011200	.001350	....	....	
13,600	68,000	.013000	.001900	....	....	
14,000	70,000	.014750	.001650	....	....	
14,400	72,000	.016700	.001950	....	....	
14,800	74,000	.018350	.001650	....	....	
15,200	76,000	.020250	.001900	....	....	
15,600	78,000	.022500	.002250	....	....	
16,000	80,000	.024750	.002250	....	....	
16,400	82,000	.026800	.002050	....	....	
16,800	84,000	.029050	.002250	....	....	
17,200	86,000	.031750	.002700	....	....	
17,600	88,000	.034850	.003100	....	....	
18,000	90,000	.038400	.003550	....	....	
18,400	92,000	.042500	.004100	....	....	
18,800	94,000	.047500	.005000	....	....	
19,200	96,000	.053750	.006250	....	....	
19,600	98,000	.061250	.007500	....	....	
20,000	100,000	.0700	.008750	....	....	
20,400	102,000	.1000	.0300	....	....	
20,460	102,300	.1200	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 102,300
Elastic limit per square inch of original section...do.... 52,000
Elongation per inch after rupture..inch.. 0.1700
Elongation per inch under strain at elastic limit ....do.... .001650
Reduction in diameter at point of rupture ....do.... .065
Reduction in area after rupture, per centum of original section 23.9
Position of rupture..1″.10 from neck
Character of broken surface..granular; dull spot at the circumference
Elongation of inch sections..″.15, ″.19

No. 3307.

Marks, 22 B. J T, M
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
9,600	48,000	.001550	.000150	....	....	
9,800	49,000	.001600	.000050	....	....	Elastic limit.
10,000	50,000	.002750	.001150	....	....	
10,200	51,000	.004900	.002150	....	....	
10,400	52,000	.005650	.000750	....	....	
10,600	53,000	.006750	.001100	....	....	
10,800	54,000	.007500	.000750	....	....	
11,000	55,000	.008150	.000650	....	....	
11,200	56,000	.008900	.000750	....	....	
11,400	57,000	.009650	.000750	....	....	
11,600	58,000	.010650	.001000	....	....	
11,800	59,000	.011550	.000900	....	....	
12,000	60,000	.012250	.000700	....	....	
12,400	62,000	.014250	.002000	....	....	
12,800	64,000	.016000	.001750	....	....	
13,200	66,000	.017850	.001850	....	....	
13,600	68,000	.020050	.002200	....	....	
14,000	70,000	.022600	.002550	....	....	
14,400	72,000	.025000	.002400	....	....	
14,800	74,000	.027250	.002250	....	....	
15,200	76,000	.030100	.002850	....	....	
15,600	78,000	.033700	.003600	....	....	
16,000	80,000	.037100	.003400	....	....	
16,400	82,000	.042000	.004900	....	....	
16,800	84,000	.046500	.004500	....	....	
17,200	86,000	.053000	.006500	....	....	
17,600	88,000	.060500	.007500	....	....	
18,000	90,000	.0700	.0095	....	....	
18,400	92,000	.0900	.0200	....	....	
18,670	93,350	.1200	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93,350
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.2150
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		".85 from neck
Character of broken surface		silky
Elongation of inch sections		".11, ".32,

No. 3308.

Marks, $^{32}\mathrm{R}_{32}\mathrm{J}$ $\mathrm{T}_2\mathrm{M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	
9,600	48,000	.001600	0.	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	Elastic limit.
10,200	51,000	.006400	.004700	....	....	
10,400	52,000	.007100	.000700	....	....	
10,600	53,000	.007750	.000650	....	....	
10,800	54,000	.008600	.000850	....	....	
11,000	55,000	.009500	.000900	....	....	
11,200	56,000	.010350	.000850	....	....	
11,400	57,000	.011400	.001050	....	....	
11,600	58,000	.012400	.001000	....	....	
11,800	59,000	.013500	.001100	....	....	
12,000	60,000	.014550	.001050	....	....	
12,400	62,000	.016500	.001950	....	....	
12,800	64,000	.018600	.002100	....	....	
13,200	66,000	.020850	.002250	....	....	
13,600	68,000	.023350	.002500	....	....	
14,000	70,000	.026050	.002700	....	....	
14,400	72,000	.029000	.002950	....	....	
14,800	74,000	.032250	.003250	....	....	
15,200	76,000	.036100	.003850	....	....	
15,600	78,000	.040350	.004250	....	....	
16,000	80,000	.045350	.005000	....	....	
16,400	82,000	.052000	.006650	....	....	
16,800	84,000	.060250	.008250	....	....	
17,200	86,000	.0700	.009750	....	....	
17,600	88,000	.0900	.0200	....	....	
17,860	89,300	.1350	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89,300
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		".90 from neck
Character of broken surface		silky
Elongation of inch sections		".34*, ".14

No. 3309.

Marks, $^{32\ \mathrm{Rs}\ \mathrm{J}}_{\mathrm{T_1\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001600	.000150	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	
10,600	53,000	.001700	0.	....	....	
10,800	54,000	.001750	.000050	....	....	Elastic limit.
11,000	55,000	.002150	.000400	....	....	
11,200	56,000	.004250	.002100	....	....	
11,400	57,000	.006250	.002000	....	....	
11,600	58,000	.007000	.000750	....	....	
11,800	59,000	.007500	.000500	....	....	
12,000	60,000	.008100	.000600	....	....	
12,400	62,000	.009900	.001800	....	....	
12,800	64,000	.011550	.001650	....	....	
13,200	66,000	.013250	.001700	....	....	
13,600	68,000	.015050	.001800	....	....	
14,000	70,000	.016750	.001700	....	....	
14,400	72,000	.018850	.002100	....	....	
14,800	74,000	.020750	.001900	....	....	
15,200	76,000	.023100	.002350	....	....	
15,600	78,000	.025350	.002250	....	....	
16,000	80,000	.028150	.002800	....	....	
16,400	82,000	.031250	.003100	....	....	
16,800	84,000	.034400	.003150	....	....	
17,200	86,000	.039000	.004600	....	....	
17,600	88,000	.043000	.004000	....	....	
18,000	90,000	.049000	.006000	....	....	
18,400	92,000	.053750	.004750	....	....	
18,800	94,000	.062750	.009000	....	....	
19,200	96,000	.0750	.012250	....	....	
19,600	98,000	.1000	.0250	....	....	
19,600	98,450	.1400	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 98,450
Elastic limit per square inch of original section....................do ... 54,000
Elongation per inch after rupture....................inch.. 0.1850
Elongation per inch under strain at elastic limit....................do.... .001750
Reduction in diameter at point of rupture....................do ... .075
Reduction in area after rupture, per centum of original section.................... 27.4
Position of rupture....................″.85 from neck
Character of broken surface, granular; silky spot at circumference. Opened cracks in surface of stem
Elongation of inch sections....................″.14, ″.23*

No. 3310.

Marks, $^{\text{82 Rer J}}_{\text{T}_3\text{ M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001600	.000200	....	....	Elastic limit.
10,200	51,000	.002000	.000400	....	....	
10,400	52,000	.004250	.002250	....	....	
10,600	53,000	.005500	.001250	....	....	
10,800	54,000	.006100	.000600	....	....	
11,000	55,000	.007000	.000900	....	....	
11,200	56,000	.007750	.000750	....	....	
11,400	57,000	.008600	.000850	....	....	
11,600	58,000	.009400	.000800	....	....	
11,800	59,000	.010050	.000650	....	....	
12,000	60,000	.011000	.000950	....	....	
12,400	62,000	.012650	.001650	....	....	
12,800	64,000	.014600	.001850	....	....	
13,200	66,000	.016250	.001750	....	....	
13,600	68,000	.018500	.002250	....	....	
14,000	70,000	.020750	.002250	....	....	
14,400	72,000	.022600	.001850	....	....	
14,800	74,000	.025000	.002400	....	....	
15,200	76,000	.028000	.003000	....	....	
15,600	78,000	.031050	.003050	....	....	
16,000	80,000	.034050	.003000	....	....	
16,400	82,000	.037350	.003300	....	....	
16,800	84,000	.041750	.004400	....	....	
17,200	86,000	.046250	.004500	....	....	
17,600	88,000	.052750	.006500	....	....	
18,000	90,000	.059500	.006750	....	....	
18,400	92,000	.0650	.0055	....	....	
18,800	94,000	.0900	.0250	....	....	
19,090	95,450	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 95,450
Elastic limit per square inch of original section ....do.... 50,000
Elongation per inch after rupture ....inch.. 0.2000
Elongation per inch under strain at elastic limit ....do.... .001600
Reduction in diameter at point of rupture ....do.... .085
Reduction in area after rupture, per centum of original section 30.7
Position of rupture ....".65 from neck
Character of broken surface ....granular; silky spot at the circumference
Elongation of inch sections ....".12, ".28

No. 3167.

Marks, $\overset{32\ F_{ss}\ J}{T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	....	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	,001550	.000050	....	....	
9,600	48,000	.001550	0.	....	....	
9,800	49,000	.001600	.000050	....	....	
10,000	50,000	.001700	.000100	....	....	
10,200	51,000	.001700	0.	....	....	
10,400	52,000	.001750	.000050	....	....	Elastic limit.
10,600	53,000	.001900	.000150	....	....	
10,800	54,000	.002300	.000400	....	....	
11,000	55,000	.003100	.000800	....	....	
11,200	56,000	.003750	.000650	....	....	
11,400	57,000	.004500	.000750	....	....	
11,600	58,000	.005200	.000700	....	....	
11,800	59,000	.006100	.000900	....	....	
12,000	60,000	.007100	.001000	....	....	
12,400	62,000	.008400	.001300	....	....	
12,800	64,000	.010050	.001650	....	....	
13,200	66,000	.011600	.001550	....	....	
13,600	68,000	.013300	.001700	....	....	
14,000	70,000	.015050	.001750	....	....	
14,400	72,000	.017250	.002200	....	....	
14,800	74,000	.019000	.001750	....	....	
15,200	76,000	.021000	.002000	....	....	
15,600	78,000	.023000	.002000	....	....	
16,000	80,000	.025400	.002400	....	....	
16,400	82,000	.028000	.002600	....	....	
16,800	84,000	.030750	.002750	....	....	
17,200	86,000	.034000	.003250	....	....	
17,600	88,000	.037000	.003000	....	....	
18,000	90,000	.041000	.004000	....	....	
18,400	92,000	.0475	.0065	....	....	
18,800	94,000	.0525	.0050	....	....	
19,200	96,000	.0575	.0050	....	....	
19,600	98,000	.0650	.0075	....	....	
20,000	100,000	.0850	.0200	....	....	
20,300	101,500	.1200	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	101,500
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		37.1
Position of rupture		″.75 from neck
Character of broken surface		silky, 70 per cent.; granular, 30 per cent.
Elongation of inch sections		″.30*, ″.12

No. 3168.

Marks, $\substack{32\ R\ J \\ T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000400	.000100	0.		
4,000	20,000	.000600	.000200	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000900	.000150	0.		
7,000	35,000	.001050	.000150	0.		
8,000	40,000	.001250	.000200	.000050	.000050	
9,000	45,000	.001400	.000150			
10,000	50,000	.001600	.000200			
10,200	51,000	.001650	.000050			
10,400	52,000	.001700	.000050			
10,600	53,000	.001750	.000050			
10,800	54,000	.001800	.000050			
11,000	55,000	.001850	.000050			Elastic limit.
11,200	56,000	.002200	.000450			
11,400	57,000	.002800	.000600			
11,600	58,000	.003300	.000500			
11,800	59,000	.004000	.000700			
12,000	60,000	.004750	.000750			
12,400	62,000	.006250	.001500			
12,800	64,000	.007900	.001650			
13,200	66,000	.009350	.001450			
13,600	68,000	.011000	.001650			
14,000	70,000	.012650	.001650			
14,400	72,000	.014500	.001850			
14,800	74,000	.016100	.001600			
15,200	76,000	.017850	.001750			
15,600	78,000	.020050	.002200			
16,000	80,000	.022000	.001950			
16,400	82,000	.024500	.002500			
16,800	84,000	.026800	.002300			
17,200	86,000	.029150	.002350			
17,600	88,000	.032100	.002950			
18,000	90,000	.035100	.003000			
18,400	92,000	.039250	.004150			
18,800	94,000	.043500	.004250			
19,200	96,000	.048100	.004600			
19,600	98,000	.0550	.0069			
20,000	100,000	.0625	.0075			
20,400	102,000	.0800	.0175			
20,710	103,550	.1050	.0250			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	103,550
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1650
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		″.45 from neck
Character of broken surface		silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		″.09, ″.24*

No. 3484.

Marks, $\overset{28\,R_{s}\,J}{T_{2}\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001550	0.	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001800	.000100	....	....	
10,400	52,000	.001850	.000050	....	....	
10,600	53,000	.001900	.000050	....	....	Elastic limit.
10,800	54,000	.002250	.000350	....	....	
11,000	55,000	.004250	.002000	....	....	
11,200	56,000	.005650	.001400	....	....	
11,400	57,000	.006500	.000850	....	....	
11,600	58,000	.007500	.001000	....	....	
11,800	59,000	.008500	.001000	....	....	
12,000	60,000	.009250	.000750	....	....	
12,400	62,000	.011300	.002050	....	....	
12,800	64,000	.013250	.001950	....	....	
13,200	66,000	.015250	.002000	....	....	
13,600	68,000	.017250	.002000	....	....	
14,000	70,000	.019500	.002250	....	....	
14,400	72,000	.022300	.002800	....	....	
14,800	74,000	.025300	.003000	....	....	
15,200	76,000	.028000	.002700	....	....	
15,600	78,000	.030650	.002650	....	....	
16,000	80,000	.034500	.003850	....	....	
16,400	82,000	.038500	.004000	....	....	
16,800	84,000	.043750	.005250	....	....	
17,200	86,000	.049500	.005750	....	....	
17,600	88,000	.057250	.007750	....	....	
18,000	90,000	.0650	.007750	....	....	
18,400	92,000	.0900	.0250	....	....	
18,620	93,100	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	93,100
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.2500
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.34*, ″.1

No. 3485.

Marks, $\overset{32\ R_{ss}\ J}{T_4\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001500	.000150	0.	....	
10,000	50,000	.001700	.000200	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	
10,600	53,000	.001850	.000050	....	....	
10,800	54,000	.001950	.000100	....	....	Elastic limit.
11,000	55,000	.003000	.001050	....	....	
11,200	56,000	.004500	.001500	....	....	
11,400	57,000	.005850	.001350	....	....	
11,600	58,000	.006800	.000950	....	....	
11,800	59,000	.007600	.000800	....	....	
12,000	60,000	.008500	.000900	....	....	
12,400	62,000	.010500	.002000	....	....	
12,800	64,000	.012500	.002000	....	....	
13,200	66,000	.014350	.001850	....	....	
13,600	68,000	.016300	.001950	....	....	
14,000	70,000	.018600	.002300	....	....	
14,400	72,000	.021000	.002400	....	....	
14,800	74,000	.023500	.002500	....	....	
15,200	76,000	.026250	.002750	....	....	
15,600	78,000	.029350	.003100	....	....	
16,000	80,000	.032650	.003300	....	....	
16,400	82,000	.036300	.003650	....	....	
16,800	84,000	.040750	.004450	....	....	
17,200	86,000	.046250	.005500	....	....	
17,600	88,000	.053000	.006750	....	....	
18,000	90,000	.062750	.009750	....	....	
18,400	92,000	.0800	.017250	....	....	
18,800	94,000	.1050	.0250	....	....	
18,860	94,300	.1250	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	94,300
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".85 from neck
Character of broken surface		silky
Elongation of inch sections		".33*, ".15

No. 3169.

Marks, 32 Rs J
T, M
Diameter, ".505.
Sectional area; .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001600	.000150	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001650	0.	....	....	
10,600	53,000	.001700	.000050	....	....	
10,800	54,000	.001750	.000050	....	....	Elastic limit.
11,000	55,000	.001950	.000200	....	....	
11,200	56,000	.003550	.001600	....	....	
11,400	57,000	.004550	.001000	....	....	
11,600	58,000	.005500	.000950	....	....	
11,800	59,000	.006100	.000600	....	....	
12,000	60,000	.007100	.001000	....	....	
12,400	62,000	.008550	.001450	....	....	
12,800	64,000	.010250	.001700	....	....	
13,200	66,000	.012000	.001750	....	....	
13,600	68,000	.013900	.001900	....	....	
14,000	70,000	.015650	.001750	....	....	
14,400	72,000	.018060	.002400	....	....	
14,800	74,000	.019750	.001700	....	....	
15,200	76,000	.021750	.002000	....	....	
15,600	78,000	.024350	.002600	....	....	
16,000	80,000	.026700	.002350	....	....	
16,400	82,000	.029600	.002900	....	....	
16,800	84,000	.032500	.002900	....	....	
17,200	86,000	.035500	.003000	....	....	
17,600	88,000	.039750	.004250	....	....	
18,000	90,000	.044500	.004750	....	....	
18,400	92,000	.050000	.005500	....	....	
18,800	94,000	.0550	.0050	....	....	
19,200	96,000	.0650	.0100	....	....	
19,600	98,000	.0850	.0200	....	....	
19,940	99,700	.1150	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 99,
Elastic limit per square inch of original section..............................do.... 54,
Elongation per inch after rupture..............................inch.. 0. 2
Elongation per inch under strain at elastic limit..............................do.... .001
Reduction in diameter at point of rupture..............................do.... .
Reduction in area after rupture, per centum of original section.............................. 34
Position of rupture..............................".75 from ne
Character of broken surface..............................granular, 60 per cent.; silky,40 per ce
Elongation of inch sections..............................".28*, "

No. 3170.

Marks, $^{32\ \mathrm{Res}\ J}_{T_3\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001800	.000100	....	....	Elastic limit.
10,600	53,000	.002350	.000550	....	....	
10,800	54,000	.003100	.000750	....	....	
11,000	55,000	.004000	.000900	....	....	
11,200	56,000	.004750	.000750	....	....	
11,400	57,000	.005500	.000750	....	....	
11,600	58,000	.006500	.001000	....	....	
11,800	59,000	.007250	.000750	....	....	
12,000	60,000	.008100	.000850	....	....	
12,400	62,000	.009150	.001050	....	....	
12,800	64,000	.010600	.001450	....	....	
13,200	66,000	.012350	.001750	....	....	
13,600	68,000	.014350	.002000	....	....	
14,000	70,000	.016100	.001750	....	....	
14,400	72,000	.017700	.001600	....	....	
14,800	74,000	.019500	.001800	....	....	
15,200	76,000	.021600	.002100	....	....	
15,600	78,000	.023400	.001800	....	....	
16,000	80,000	.025850	.002450	....	....	
16,400	82,000	.028500	.002650	....	....	
16,800	84,000	.030750	.002250	....	....	
17,200	86,000	.033550	.002800	....	....	
17,600	88,000	.037250	.003700	....	....	
18,000	90,000	.041000	.003750	....	....	
18,400	92,000	.045250	.004250	....	....	
18,800	94,000	.050250	.005000	....	....	
19,200	96,000	.056400	.006150	....	....	
19,600	98,000	.0625	.0061	....	....	
20,000	100,000	.0800	.0175	....	....	
20,370	101,850	.1100	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	101,850
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		37.1
Position of rupture		″.80 from neck
Character of broken surface		silky, 50 per cent.; granular, 50 per cent.
Elongation of inch sections		″.10, ″.28*

No. 3305.

Marks, $\overset{32\,B_{11}\,J}{T_1\,M}$
Diameter, ".505.
***Sectional* area,** .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	Elastic limit.
10,200	51,000	.002550	.000900	....	....	
10,400	52,000	.003250	.000700	....	....	
10,600	53,000	.003900	.000650	....	....	
10,800	54,000	.004550	.000650	....	....	
11,000	55,000	.005350	.000800	....	....	
11,200	56,000	.006100	.000750	....	....	
11,400	57,000	.007000	.000900	....	....	
11,600	58,000	.007600	.000600	....	....	
11,800	59,000	.008400	.000800	....	....	
12,000	60,000	.009100	.000700	....	....	
12,400	62,000	.010950	.001850	....	....	
12,800	64,000	.012600	.001650	....	....	
13,200	66,000	.014150	.001550	....	....	
13,600	68,000	.016250	.002100	....	....	
14,000	70,000	.018100	.001850	....	....	
14,400	72,000	.020350	.002250	....	....	
14,800	74,000	.022750	.002400	....	....	
15,200	76,000	.025100	.002350	....	....	
15,600	78,000	.027500	.002400	....	....	
16,000	80,000	.030500	.003000	....	....	
16,400	82,000	.033750	.003250	....	....	
16,800	84,000	.037400	.003650	....	....	
17,200	86,000	.041500	.004100	....	....	
17,600	88,000	.046300	.004800	....	....	
18,000	90,000	.052500	.006200	....	....	
18,400	92,000	.060250	.007750	....	....	
18,800	94,000	.0700	.009750	....	....	
19,200	96,000	.1000	.0300	....	....	
19,410	97,050	.1400	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 97
Elastic limit per square inch of original section ....do.... 50
Elongation per inch after rupture ....inch.. 0.
Elongation per inch under strain at elastic limit ....do.... .00
Reduction in diameter at point of rupture ....do....
Reduction in area after rupture, per centum of original section ....
Position of rupture ....".70 from
Character of broken surface ....silky; granular at circumfer
Elongation of inch sections ....".11,

No. 3306.

Marks, $\genfrac{}{}{0pt}{}{^{32}R_{11}\,J}{T_2\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
*Pounds.**	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	.000050	.000050	
2,000	10,000	.000250	.000150	.000050	0.	
3,000	15,000	.000400	.000150	.000050	0.	
4,000	20,000	.000600	.000200	.000050	0.	
5,000	25,000	.000750	.000150	.000050	0.	
6,000	30,000	.000900	.000150	.000050	0.	
7,000	35,000	.001050	.000150	.000050	0.	
8,000	40,000	.001250	.000200	.000050	0.	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001700	.000100	....	....	Elastic limit.
10,000	50,000	.002100	.000400	....	....	
10,200	51,000	.002750	.000650	....	....	
10,400	52,000	.003750	.001000	....	....	
10,600	53,000	.004600	.000850	....	....	
10,800	54,000	.005500	.000900	....	....	
11,000	55,000	.006150	.000650	....	....	
11,200	56,000	.007000	.000850	....	....	
11,400	57,000	.007800	.000800	....	....	
11,600	58,000	.008600	.000800	....	....	
11,800	59,000	.009250	.000650	....	....	
12,000	60,000	.010100	.000850	....	....	
12,400	62,000	.011900	.001800	....	....	
12,800	64,000	.013700	.001800	....	....	
13,200	66,000	.015300	.001600	....	....	
13,600	68,000	.017250	.001950	....	....	
14,000	70,000	.019500	.002250	....	....	
14,400	72,000	.021500	.002000	....	....	
14,800	74,000	.024000	.002500	....	....	
15,200	76,000	.026750	.002750	....	....	
15,600	78,000	.029250	.002500	....	....	
16,000	80,000	.032150	.002900	....	....	
16,400	82,000	.035350	.003200	....	....	
16,800	84,000	.039250	.003900	....	....	
17,200	86,000	.044000	.004750	....	....	
17,600	88,000	.049250	.005250	....	....	
18,000	90,000	.055750	.006500	....	....	
18,400	92,000	.0650	.009250	....	....	
18,800	94,000	.0750	.0100	....	....	
19,200	96,000	.1100	.0350	....	....	
19,240	96,200	.1450	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	96,200
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40.3
Position of rupture		″.90 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.13, ″.20

No. 3478.

Marks, 32 Ba J T, M
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	Elastic limit.
9,600	48,000	.003000	.001450	....	....	
9,800	49,000	.004750	.001750	....	....	
10,000	50,000	.005850	.000600	....	....	
10,200	51,000	.006250	.000900	....	....	
10,400	52,000	.007000	.000750	....	....	
10,600	53,000	.007750	.000750	....	....	
10,800	54,000	.008500	.000750	....	....	
11,000	55,000	.009650	.001150	....	....	
11,200	56,000	.010250	.000600	....	....	
11,400	57,000	.010850	.000600	....	....	
11,600	58,000	.011750	.000900	....	....	
11,800	59,000	.012850	.001100	....	....	
12,000	60,000	.013900	.001050	....	....	
12,400	62,000	.015250	.001350	....	....	
12,800	64,000	.016750	.001500	....	....	
13,200	66,000	.018800	.002050	....	....	
13,600	68,000	.021000	.002200	....	....	
14,000	70,000	.023350	.002350	....	....	
14,400	72,000	.025850	.002500	....	....	
14,800	74,000	.028350	.002500	....	....	
15,200	76,000	.031000	.002650	....	....	
15,600	78,000	.034250	.003250	....	....	
16,000	80,000	.037650	.003400	....	....	
16,400	82,000	.042050	.004400	....	....	
16,800	84,000	.046500	.004450	....	....	
17,200	86,000	.053250	.006750	....	....	
17,600	88,000	.060750	.007500	....	....	
18,000	90,000	.071250	.010500	....	....	
18,400	92,000	.0900	.018750	....	....	
18,700	93,500	.1250	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 93,500
Elastic limit per square inch of original section..........do.... 47,000
Elongation per inch after rupture..........inch.. 0.1550
Elongation per inch under strain at elastic limit..........do.... .001550
Reduction in diameter at point of rupture..........do.... ..075
Reduction in area after rupture, per centum of original section.......... 27.4
Position of rupture..........".38 from neck
Character of broken surface..........silky, 50 per cent.; granular, 50 per cent.
Elongation of inch sections..........".09, ".22*

No. 3479.

Marks, $\overset{32\ \mathrm{Re}\ \mathrm{J}}{\mathrm{T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000500	.000200	0.	....	
4, 000	20, 000	.000650	.000150	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001350	.000200	0.	....	
8, 200	41, 000	.001400	.000050	....	....	
8, 400	42, 000	.001450	.000050	....	....	
8, 600	43, 000	.001500	.000050	....	....	
8, 800	44, 000	.001500	0.	....	....	Elastic limit.
9, 000	45, 000	.001700	.000200	....	....	
9, 200	46, 000	.004550	.002850	....	....	
9, 400	47, 000	.005250	.000700	....	....	
9, 600	48, 000	.006500	.001250	....	....	
9, 800	49, 000	.006750	.000250	....	....	
10, 000	50, 000	.007400	.000650	....	....	
10, 200	51, 000	.008150	.000750	....	....	
10, 400	52, 000	.009000	.000850	....	....	
10, 600	53, 000	.009750	.000750	....	....	
10, 800	54, 000	.010600	.000850	....	....	
11, 000	55, 000	.011350	.000750	....	....	
11, 200	56, 000	.012100	.000750	....	....	
11, 400	57, 000	.013100	.001000	....	....	
11, 600	58, 000	.014000	.000900	....	....	
11, 800	59, 000	.015050	.001050	....	....	
12, 000	60, 000	.016000	.000950	....	....	
12, 400	62, 000	.018000	.002000	....	....	
12, 800	64, 000	.020400	.002400	....	....	
13, 200	66, 000	.022600	.002200	....	....	
13, 600	68, 000	.025000	.002400	....	....	
14, 000	70, 000	.027750	.002750	....	....	
14, 400	72, 000	.031000	.003250	....	....	
14, 800	74, 000	.034000	.003000	....	....	
15, 200	76, 000	.037650	.003650	....	....	
15, 600	78, 000	.042250	.004600	....	....	
16, 000	80, 000	.048000	.005750	....	....	
16, 400	82, 000	.054250	.006250	....	....	
16, 800	84, 000	.062500	.008250	....	....	
17, 200	86, 000	.077500	.015000	....	....	
17, 600	88, 000	.095500	.0180	....	....	
17, 960	89, 800	.1500	.0545	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89, 800
Elastic limit per square inch of original section	do ...	44, 000
Elongation per inch after rupture	inch..	0. 2350
Elongation per inch under strain at elastic limit	do ...	.001500
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		42. 3
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.29, ″.18

No. 3324.

Marks, $^{32\ R_4\ J}_{T_1\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,600	48,000	.001600	.000150	....	....	
9,800	49,000	.001650	.000050	....	....	Elastic limit.
10,000	50,000	.001850	.000200	....	....	
10,200	51,000	.001950	.000100	....	....	
10,400	52,000	.003000	.001050	....	....	
10,600	53,000	.003700	.000700	....	....	
10,800	54,000	.004350	.000650	....	....	
11,000	55,000	.005050	.000700	....	....	
11,200	56,000	.005800	.000750	....	....	
11,400	57,000	.006400	.000600	....	....	
11,600	58,000	.007200	.000800	....	....	
11,800	59,000	.007900	.000700	....	....	
12,000	60,000	.008550	.000650	....	....	
12,400	62,000	.010400	.001850	....	....	
12,800	64,000	.012000	.001600	....	....	
13,200	66,000	.013750	.001750	....	....	
13,600	68,000	.015000	.001250	....	....	
14,000	70,000	.016500	.001500	....	....	
14,400	72,000	.018500	.002000	....	....	
14,800	74,000	.020250	.001750	....	....	
15,200	76,000	.022500	.002250	....	....	
15,600	78,000	.024500	002000	....	....	
16,000	80,000	.026600	.002100	....	....	
16,400	82,000	.029500	.002900	....	....	
16,800	84,000	.032750	.003250	....	....	
17,200	86,000	.0..5750	.003000	....	....	
17,600	88,000	.039500	.003750	....	....	
18,000	90,000	.043750	.004250	....	....	
18,400	92,000	.049500	.005750	....	....	
18,800	94,000	.059600	.010100	....	....	
19,200	96,000	.0650	.0054	....	....	
19,600	98,000	.0800	.0150	....	....	
20,000	100,000	.1100	.0300	....	....	
20,010	100,050	.1250	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,050
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		37.1
Position of rupture		".65 from neck
Character of broken surface		silky; interspersed with granular metal at the circumference
Elongation of inch sections		".09, ".29

No. 3325.

Marks, $\overset{32\ R_{13}\ J}{T_2\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000350	.000200	0.	....	
3, 000	15, 000	.000500	.000150	0.	....	
4, 000	20, 000	.000650	.000150	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001200	.000200	0.	....	
8, 000	40, 000	.001350	.000150	0.	....	
9, 000	45, 000	.001550	.000200	....	....	
10, 000	50, 000	.001750	.000200	....	....	
10, 200	51, 000	.001800	.000050	....	....	
10, 400	52, 000	.001850	.000050	....	....	Elastic limit.
10, 600	53, 000	.002100	.000250	....	....	
10, 800	54, 000	.002400	.000300	....	....	
11, 000	55, 000	.003000	.000600	....	....	
11, 200	56, 000	.003600	.000600	....	....	
11, 400	57, 000	.004150	.000550	....	....	
11, 600	58, 000	.004850	.000700	....	....	
11, 800	59, 000	.005550	.000700	....	....	
12, 000	60, 000	.006100	.000550	....	....	
12, 400	62, 000	.007700	.001600	....	....	
12, 800	64, 000	.009050	.001350	....	....	
13, 200	66, 000	.010600	.001550	....	....	
13, 600	68, 000	.012100	.001500	....	....	
14, 000	70, 000	.013750	.001650	....	....	
14, 400	72, 000	.015150	.001400	....	....	
14, 800	74, 000	.016950	.001800	....	....	
15, 200	76, 000	.018500	.001550	....	....	
15, 600	78, 000	.020500	.002000	....	....	
16, 000	80, 000	.022400	.001900	....	....	
16, 400	82, 000	.024550	.002150	....	....	
16, 800	84, 000	.027000	.002450	....	....	
17, 200	86, 000	.029150	.002150	....	....	
17, 600	88, 000	.032000	.002850	....	....	
18, 000	90, 000	.035100	.003100	....	....	
18, 400	92, 000	.038600	.003500	....	....	
18, 800	94, 000	.042550	.003950	....	....	
19, 200	96, 000	.047350	.004800	....	....	
19, 600	98, 000	.053500	.006150	....	....	
20, 000	100, 000	.060750	.007250	....	....	
20, 400	102, 000	.0675	.006750	....	....	
20, 800	104, 000	.0950	.0275	....	....	
20, 950	104, 750	.1150	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104, 750
Elastic limit per square inch of original section	do....	52, 000
Elongation per inch after rupture	inch..	0. 2050
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.095
Reduction in area after rupture, per centum of original section		34. 0
Position of rupture		″.85 from neck
Character of broken surface		silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		″.27*, ″.14

No. 3326.

Marks, $^{38}\text{B}_{44}$ J
T, M
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,200	46,000	.001500	.000050	....	....	Elastic limit.
9,400	47,000	.002000	.000500	....	....	
9,600	48,000	.003150	.000159	....	....	
9,800	49,000	.004300	.001150	....	....	
10,000	50,000	.005400	.001100	....	....	
10,200	51,000	.006500	.001100	....	....	
10,400	52,000	.007500	.001000	....	....	
10,600	53,000	.008100	.000600	....	....	
10,800	54,000	.008750	.000650	....	....	
11,000	55,000	.009800	.001050	....	....	
11,200	56,000	.010700	.000900	....	....	
11,400	57,000	.011500	.000800	....	....	
11,600	58,000	.012400	.000900	....	....	
11,800	59,000	.013150	.000750	....	....	
12,000	60,000	.014000	.000850	....	....	
12,400	62,000	.015650	.001650	....	....	
12,800	64,000	.018050	.002400	....	....	
13,200	66,000	.020500	.002450	....	....	
13,600	68,000	.023000	.002500	....	....	
14,000	70,000	.025550	.002550	....	....	
14,400	72,000	.027850	.002300	....	....	
14,800	74,000	.030350	.002500	....	....	
15,200	76,000	.033500	.003150	....	....	
15,600	78,000	.037100	.003600	....	....	
16,000	80,000	.041500	.004400	....	....	
16,400	82,000	.046750	.005250	....	....	
16,800	81,000	.053500	.006750	....	....	
17,200	86,000	.060500	.007000	....	....	
17,600	88,000	.0700	.0095	....	....	
18,000	90,000	.0900	.0200	....	....	
18,270	91,350	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..
Elastic limit per square inch of original section ....do....
Elongation per inch after rupture ....inch..
Elongation per inch under strain at elastic limit ....do....
Reduction in diameter at point of rupture ....do....
Reduction in area after rupture, per centum of original section ....
Position of rupture ....".40 from
Character of broken surface ....
Elongation of inch sections ....".10,

No. 3327.

Marks, $\overset{82\,\text{R}_4\,\text{J}}{\text{T}_2\,\text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch,	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
10,000	50,000	.001700	.000200	....	....	
10,200	51,000	.001750	.000050	....	....	Elastic limit.
10,400	52,000	.001900	.000150	....	....	
10,600	53,000	.002400	.000500	....	....	
10,800	54,000	.003500	.001100	....	....	
11,000	55,000	.004700	.001200	....	....	
11,200	56,000	.005550	.000850	....	....	
11,400	57,000	.006400	.000850	....	....	
11,600	58,000	.007300	.000900	....	....	
11,800	59,000	.008150	.000850	....	....	
12,000	60,000	.008950	.000800	....	....	
12,400	62,000	.011100	.002150	....	....	
12,800	64,000	.012700	.001600	....	....	
13,200	66,000	.014550	.001850	....	....	
13,600	68,000	.016500	.001950	....	....	
14,000	70,000	.018500	.002000	....	....	
14,400	72,000	.020600	.002100	....	....	
14,800	74,000	.023100	.002500	....	....	
15,200	76,000	.025250	.002150	....	....	
15,600	78,000	.028500	.003250	....	....	
16,000	80,000	.031500	.003000	....	....	
16,400	82,000	.035000	.003500	....	....	
16,800	84,000	.038250	.003250	....	....	
17,200	86,000	.043050	.004800	....	....	
17,600	88,000	.049250	.006200	....	....	
18,000	90,000	.057000	.007750	....	....	
18,400	92,000	.0670	.0100	....	....	
18,800	94,000	.0850	.0180	....	....	
19,120	95,600	.1200	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	95,600
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.055
Reduction in area after rupture, per centum of original section		20.5
Position of rupture		1″.05 from neck
Character of broken surface		granular; flaky spot at the circumference
Elongation of inch sections		″.12, ″.18*

No. 3326.

Marks, 32 R44 J
T, M

Diameter, ".505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,200	46,000	.001500	.000050	....	....	Elastic limit.
9,400	47,000	.002000	.000500	....	....	
9,600	48,000	.003150	.000150	....	....	
9,800	49,000	.004300	.001150	....	....	
10,000	50,000	.005400	.001100	....	....	
10,200	51,000	.006500	.001100	....	....	
10,400	52,000	.007500	.001000	....	....	
10,600	53,000	.008100	.000600	....	....	
10,800	54,000	.008750	.000650	....	....	
11,000	55,000	.009800	.001050	....	....	
11,200	56,000	.010700	.000900	....	....	
11,400	57,000	.011500	.000800	....	....	
11,600	58,000	.012400	.000900	....	....	
11,800	59,000	.013150	.000750	....	....	
12,000	60,000	.014000	.000850	....	....	
12,400	62,000	.015650	.001650	....	....	
12,800	64,000	.018050	.002400	....	....	
13,200	66,000	.020500	.002450	....	....	
13,600	68,000	.023000	.002500	....	....	
14,000	70,000	.025550	.002550	....	....	
14,400	72,000	.027850	.002300	....	....	
14,800	74,000	.030350	.002500	....	....	
15,200	76,000	.033500	.003150	....	....	
15,600	78,000	.037100	.003600	....	....	
16,000	80,000	.041500	.004400	....	....	
16,400	82,000	.046750	.005250	....	....	
16,800	84,000	.053500	.006750	....	....	
17,200	86,000	.060500	.007000	....	....	
17,600	88,000	.0700	.0095	....	....	
18,000	90,000	.0900	.0200	....	....	
18,270	91,350	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91,350
Elastic limit per square inch of original section	do....	46,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40.8
Position of rupture		".40 from neck
Character of broken surface		silky
Elongation of inch sections		".10, ".30*

No. 3340.

Marks, ${}^{32\ R,\ J}_{\quad T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000250	.000100	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001400	.000150	....	....	
9,200	46,000	.001450	.000050	....	....	
9,400	47,000	.001500	.000050	....	....	
9,600	48,000	.001550	.000050	....	....	
9,800	49,000	.001650	.000100	....	....	
10,000	50,000	.001700	.000050	....	....	Elastic limit.
10,200	51,000	.003200	.001600	....	....	
10,400	52,000	.004900	.001700	....	....	
10,600	53,000	.005550	.000650	....	....	
10,800	54,000	.006400	.000850	....	....	
11,000	55,000	.007250	.000850	....	....	
11,200	56,000	.008100	.000850	....	....	
11,400	57,000	.009050	.000950	....	....	
11,600	58,000	.009850	.000800	....	....	
11,800	59,000	.010750	.000900	....	....	
12,000	60,000	.011600	.000850	....	....	
12,400	62,000	.013600	.002000	....	....	
12,800	64,000	.015600	.002000	....	....	
13,200	66,000	.017600	.002000	....	....	
13,600	68,000	.020000	.002400	....	....	
14,000	70,000	.022100	.002100	....	....	
14,400	72,000	.025250	.003150	....	....	
14,800	74,000	.028750	.003500	....	....	
15,200	76,000	.031000	.002250	....	....	
15,600	78,000	.034000	.003000	....	....	
16,000	80,000	.038500	.004500	....	....	
16,400	82,000	.043000	.004500	....	....	
16,800	84,000	.048750	.005750	....	....	
17,200	86,000	.056000	.007250	....	....	
17,600	88,000	.065750	.009750	....	....	
18,000	90,000	.0800	.014250	....	....	
18,400	92,000	.1100	.0300	....	....	
18,520	92,600	.1450	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	92,600
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		1″.00 from neck
Character of broken surface		silky
Elongation of inch sections		″.16, ″.32*

No. 3472.

Marks, $^{82\ \text{R}_{44}\ \text{J}}_{\text{T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000400	.000250	0.	....	
3, 000	15, 000	.000550	.000150	0.	....	
4, 000	20, 000	.000700	.000150	0.	....	
5, 000	25, 000	.000850	.000150	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001300	.000150	0.	....	
9, 000	45, 000	.001500	.000200	....	....	
9, 200	46, 000	.001550	.000050	....	....	
9, 400	47, 000	.001600	.000050	....	....	
9, 600	48, 000	.001600	0.	....	....	Elastic limit.
9, 800	49, 000	.001750	.000150	....	....	
10, 000	50, 000	.002350	.000600	....	....	
10, 200	51, 000	.003400	.001050	....	....	
10, 400	52, 000	.004200	.000800	....	....	
10, 600	53, 000	.005100	.000900	....	....	
10, 800	54, 000	.006000	.000900	....	....	
11, 000	55, 000	.006800	.000800	....	....	
11, 200	56, 000	.007750	.000950	....	....	
11, 400	57, 000	.008600	.000850	....	....	
11, 600	58, 000	.009500	.000900	....	....	
11, 800	59, 000	.010350	.000850	....	....	
12, 000	60, 000	.011100	.000750	....	....	
12, 400	62, 000	.013050	.001950	....	....	
12, 800	64, 000	.015250	.002200	....	....	
13, 200	66, 000	.017050	.001800	....	....	
13, 600	68, 000	.019250	.002200	....	....	
14, 000	70, 000	.021000	.001750	....	....	
14, 400	72, 000	.023900	.002900	....	....	
14, 800	74, 000	.027000	.003100	....	....	
15, 200	76, 000	.029850	.002850	....	....	
15, 600	78, 000	.032800	.002950	....	....	
16, 000	80, 000	.036550	.003750	....	....	
16, 400	82, 000	.041050	.004500	....	....	
16, 800	84, 000	.046250	.005200	....	....	
17, 200	86, 000	.053000	.006750	....	....	
17, 600	88, 000	.0600	.0070	....	....	
18, 000	90, 000	.0700	.0100	....	....	
18, 400	92, 000	.0950	.0250	....	....	
18, 520	92, 600	.1300	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	92, 600
Elastic limit per square inch of original section	do....	48, 000
Elongation per inch after rupture	inch..	0. 2400
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		46. 2
Position of rupture		1″.00 from neck
Character of broken surface		silky
Elongation of inch sections		″.16, ″.32

No. 3473.

Marks, $^{32\,\mathrm{R.\,J}}_{\mathrm{T,\,M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000250	.000100	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001550	.000050	....	....	Elastic limit.
9,400	47,000	.001950	.000400	....	....	
9,600	48,000	.003450	.001500	....	....	
9,800	49,000	.004500	.001050	....	....	
10,000	50,000	.005450	.000950	....	....	
10,200	51,000	.006250	.000800	....	....	
10,400	52,000	.007050	.000800	....	....	
10,600	53,000	.007850	.000800	....	....	
10,800	54,000	.008750	.000900	....	....	
11,000	55,000	.009600	.000850	....	....	
11,200	56,000	.010600	.001000	....	....	
11,400	57,000	.011400	.000800	....	....	
11,600	58,000	.012300	.000900	....	....	
11,800	59,000	.013150	.000850	....	....	
12,000	60,000	.014150	.001000	....	....	
12,400	62,000	.016250	.002100	....	....	
12,800	64,000	.018300	.002050	....	....	
13,200	66,000	.020500	.002200	....	....	
13,600	68,000	.023250	.002750	....	....	
14,000	70,000	.026000	.002750	....	....	
14,400	72,000	.028700	.002700	....	....	
14,800	74,000	.032050	.003350	....	....	
15,200	76,000	.035600	.003550	....	....	
15,600	78,000	.040050	.004450	....	....	
16,000	80,000	.045100	.005050	....	....	
16,400	82,000	.052500	.007400	....	....	
16,800	84,000	.061000	.008500	....	....	
17,200	86,000	.072400	.011400	....	....	
17,600	88,000	.0950	.0226	....	....	
17,850	89,250	.1450	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section............pounds.. 89,250
Elastic limit per square inch of original section............do.... 46,000
Elongation per inch after rupture............inch.. 0.2500
Elongation per inch under strain at elastic limit............do.... .001550
Reduction in diameter at point of rupture............do.... .135
Reduction in area after rupture, per centum of original section............ 40.2
Position of rupture............1″.05 from neck
Character of broken surface............silky
Elongation of inch sections............″.34*, ″.17

No. 3474.

Marks, $\overset{32\ \mathrm{R}_{17}\ \mathrm{J}}{\mathrm{T,\ M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000250	.000100	0.	....	
3, 000	15, 000	.000400	.000150	0.	....	
4, 000	20, 000	.000600	.000200	0.	....	
5, 000	25, 000	.000750	.000150	0.	....	
6, 000	30, 000	.000900	.000150	0.	....	
7, 000	35, 000	.001100	.000200	0.	....	
8, 000	40, 000	.001200	.000100	0.	....	
9, 000	45, 000	.001400	.000200	....	....	
9, 200	46, 000	.001500	.000100	....	....	Elastic limit.
9, 400	47, 000	.001600	.000100	....	....	
9, 600	48, 000	.001750	.000150	....	....	
9, 800	49, 000	.002250	.000500	....	....	
10, 000	50, 000	.003500	.001250	....	....	
10, 200	51, 000	.004550	.001050	....	....	
10, 400	52, 000	.005550	.001000	....	....	
10, 600	53, 000	.006550	.001000	....	....	
10, 800	54, 000	.007500	.000950	....	....	
11, 000	55, 000	.008500	.001000	....	....	
11, 200	56, 000	.009300	.000800	....	....	
11, 400	57, 000	.010300	.001000	....	....	
11, 600	58, 000	.011250	.000950	....	....	
11, 800	59, 000	.012100	.000850	....	....	
12, 000	60, 000	.013100	.001000	....	....	
12, 400	62, 000	.015350	.002250	....	....	
12, 800	64, 000	.017500	.002150	....	....	
13, 200	66, 000	.019750	.002250	....	....	
13, 600	68, 000	.022500	.002750	....	....	
14, 000	70, 000	.025250	.002750	....	....	
14, 400	72, 000	.028100	.003150	....	....	
14, 800	74, 000	.031500	.003100	....	....	
15, 200	76, 000	.035150	.003650	....	....	
15, 600	78, 000	.039850	.004700	....	....	
16, 000	80, 000	.045600	.005750	....	....	
16, 400	82, 000	.053000	.007400	....	....	
16, 800	84, 000	.061000	.008000	....	....	
17, 200	86, 000	.072500	.011500	....	....	
17, 600	88, 000	.0950	.0225	....	....	
17, 810	89, 050	.1350	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89, 05
Elastic limit per square inch of original section	do....	47, 00
Elongation per inch after rupture	inch..	0. 245
Elongation per inch under strain at elastic limit	do....	.0016
Reduction in diameter at point of rupture	do....	. 14
Reduction in area after rupture, per centum of original section		49.
Position of rupture		at middle of ste
Character of broken surface		silk
Elongation of inch sections		"23*., ".2

No. 3475.

Marks, $^{32\ R.\ J}_{T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	
9,600	48,000	.001650	.000050	....	....	
9,800	49,000	.001750	.000100	....	....	Elastic limit.
10,000	50,000	.002250	.000500	....	....	
10,200	51,000	.003500	.001250	....	....	
10,400	52,000	.004100	.000600	....	....	
10,600	53,000	.005050	.000950	....	....	
10,800	54,000	.006000	.000950	....	....	
11,000	55,000	.006700	.000700	....	....	
11,200	56,000	.007550	.000850	....	....	
11,400	57,000	.008400	.000850	....	....	
11,600	58,000	.009250	.000850	....	....	
11,800	59,000	.010100	.000850	....	....	
12,000	60,000	.011000	.000900	....	....	
12,400	62,000	.012750	.001750	....	....	
12,800	64,000	.014700	.001950	....	....	
13,200	66,000	.016600	.001900	....	....	
13,600	68,000	.018800	.002200	....	....	
14,000	70,000	.020750	.001950	....	....	
14,400	72,000	.023200	.002450	....	....	
14,800	74,000	.025950	.002750	....	....	
15,200	76,000	.029000	.003050	....	....	
15,600	78,000	.031750	.002750	....	....	
16,000	80,000	.035250	.003500	....	....	
16,400	82,000	.039500	.004250	....	....	
16,800	84,000	.044500	.005000	....	....	
17,200	86,000	.050100	.005600	....	....	
17,600	88,000	.057750	.007650	....	....	
18,000	90,000	.068250	.010500	....	....	
18,400	92,000	.0850	.016750	....	....	
18,760	93,800	.1400	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 93,800
Elastic limit per square inch of original section .... do ... 49,000
Elongation per inch after rupture .... inch.. 0.2150
Elongation per inch under strain at elastic limit .... do ... .001750
Reduction in diameter at point of rupture .... do ... .125
Reduction in area after rupture, per centum of original section 43.3
Position of rupture .... 1″.00 from neck
Character of broken surface .... silky
Elongation of inch sections .... ″.15, ″28″

No. 3390.

Marks, $^{32\ R_{48}\ J}_{T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001400	.000150	....	....	
9,200	46,000	.001450	.000050	....	....	
9,400	47,000	.001500	.000050	....	....	
9,600	48,000	.001500	0.	....	....	
9,800	49,000	.001550	.000050	....	....	Elastic limit.
10,000	50,000	.001750	.000200	....	....	
10,200	51,000	.003100	.001350	....	....	
10,400	52,000	.004250	.001150	....	....	
10,600	53,000	.005250	.001000	....	....	
10,800	54,000	.006250	.001000	....	....	
11,000	55,000	.007000	.000750	....	....	
11,200	56,000	.007600	.000600	....	....	
11,400	57,000	.008350	.000750	....	....	
11,600	58,000	.009250	.000900	....	....	
11,800	59,000	.010100	.000850	....	....	
12,000	60,000	.011000	.000900	....	....	
12,400	62,000	.012750	.001750	....	....	
12,800	64,000	.015000	.002250	....	....	
13,200	66,000	.016750	.001750	....	....	
13,600	68,000	.019000	.002250	....	....	
14,000	70,000	.020500	.001500	....	....	
14,400	72,000	.023000	.002500	....	....	
14,800	74,000	.025750	.002750	....	....	
15,200	76,000	.028350	.002600	....	....	
15,600	78,000	.031350	.003000	....	....	
16,000	80,000	.034600	.003250	....	....	
16,400	82,000	.038750	.004150	....	....	
16,800	84,000	.043400	.004650	....	....	
17,200	86,000	.049000	.005600	....	....	
17,600	88,000	.057500	.008500	....	....	
18,000	90,000	.066400	.008900	....	....	
18,400	92,000	.0850	.0186	....	....	
18,800	94,000	.1150	.0300	....	....	
18,880	94,400	.1450	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 94
Elastic limit per square inch of original section ....do.... 49
Elongation per inch after rupture...inch.. 0.
Elongation per inch under strain at elastic limit..........,...............................do.... .00
Reduction in diameter at point of rupture...do....
Reduction in area after rupture, per centum of original section.......................... ...
Position of rupture ....1″.15 from
Character of broken surface...
Elongation of inch sections...″.21,

No. 3391.

Marks, $\overset{82\text{ R. J}}{\text{T, M}}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	Elastic limit.
9,600	48,000	.002400	.000850	....	....	
9,800	49,000	.003050	.000650	....	....	
10,000	50,000	.004500	.001450	....	....	
10,200	51,000	.005500	.001000	....	....	
10,400	52,000	.006500	.001000	....	....	
10,600	53,000	.007300	.000800	....	....	
10,800	54,000	.008000	.000700	....	....	
11,000	55,000	.009250	.001250	....	....	
11,200	56,000	.010000	.000750	....	....	
11,400	57,000	.010600	.000600	....	....	
11,600	58,000	.011400	.000800	....	....	
11,800	59,000	.012000	.000600	....	....	
12,000	60,000	.013000	.001000	....	....	
12,400	62,000	.014800	.001800	....	....	
12,800	64,000	.016750	.001950	....	....	
13,200	66,000	.018750	.002000	....	....	
13,600	68,000	.020750	.002000	....	....	
14,000	70,000	.023100	.002350	....	....	
14,400	72,000	.026750	.003650	....	....	
14,800	74,000	.029150	.002400	....	....	
15,200	76,000	.031800	.002650	....	....	
15,600	78,000	.034600	.002800	....	....	
16,000	80,000	.038000	.003400	....	....	
16,400	82,000	.043500	.005500	....	....	
16,800	84,000	.048750	.005250	....	....	
17,200	86,000	.056000	.007250	....	....	
17,600	88,000	.0650	.0090	....	....	
18,000	90,000	.0800	.0150	....	....	
18,400	92,000	.1050	.0250	....	....	
18,570	92,850	.1450	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	92,850
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.2300
Elongation per inch under strain at elastic limit	do	.001550
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.90 from neck
Character of broken surface		silky
Elongation of inch sections		″.13, ″.33

No. 3486.

Marks, $^{32}\overset{B\,J}{T_1\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.		
2, 000	10, 000	.000350	.000200	0.		
3, 000	15, 000	.000500	.000150	0.		
4, 000	20, 000	.000700	.000200	0.		
5, 000	25, 000	.000900	.000200	0.		
6, 000	30, 000	.001050	.000150	0.		
7, 000	35, 000	.001200	.000150	0.		
8, 000	40, 000	.001400	.000200	0.		
9, 000	45, 000	.001600	.000200			
9, 200	46, 000	.001650	.000050			
9, 400	47, 000	.001700	.000050			
9, 600	48, 000	.001800	.000100			
9, 800	49, 000	.001900	.000100			Elastic limit.
10, 000	50, 000	.003750	.001850			
10, 200	51, 000	.004600	.000850			
10, 400	52, 000	.005450	.000850			
10, 600	53, 000	.006450	.001000			
10, 800	54, 000	.007250	.000800			
11, 000	55, 000	.008250	.001000			
11, 200	56, 000	.009100	.000850			
11, 400	57, 000	.010050	.000950			
11, 600	58, 000	.011000	.000950			
11, 800	59, 000	.011900	.000900			
12, 000	60, 000	.012900	.001000			
12, 400	62, 000	.015000	.002100			
12, 800	64, 000	.017350	.002350			
13, 200	66, 000	.019550	.002200			
13, 600	68, 000	.021750	.002200			
14, 000	70, 000	.024250	.002500			
14, 400	72, 000	.027050	.002800			
14, 800	74, 000	.030150	.003100			
15, 200	76, 000	.033600	.003450			
15, 600	78, 000	.037500	.003900			
16, 000	80, 000	.042100	.004600			
16, 400	82, 000	.049000	.006900			
16, 800	84, 000	.055500	.006500			
17, 200	86, 000	.0650	.0095			
17, 600	88, 000	.0800	.0150			
18, 000	90, 000	.1100	.0300			
18, 080	90, 400	.1450	.0350			Tensile strength.

General summary.

Tensile strength per square inch of original section....pounds.. 90, 400
Elastic limit per square inch of original section....do.... 49, 000
Elongation per inch after rupture....inch.. 0. 2000
Elongation per inch under strain at elastic limit....do.... .001900
Reduction in diameter at point of rupture....do.... .095
Reduction in area after rupture, per centum of original section.... 34 0
Position of rupture....″.75 from neck
Character of broken surface....granular ; silky spot at circumference
Elongation of inch sections....″.27*, ″.13

No. 3487.

Marks, $\genfrac{}{}{0pt}{}{32\ R_{40}\ J}{T_2\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	.0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001550	0.	....	....	
9,800	49,000	.001600	.000050	....	....	
10,000	50,000	.001700	.000100	....	....	Elastic limit.
10,200	51,000	.002000	.000300	....	....	
10,400	52,000	.003050	.001050	....	....	
10,600	53,000	.004050	.001000	....	....	
10,800	54,000	.005500	.001450	....	....	
11,000	55,000	.006000	.000500	....	....	
11,200	56,000	.006900	.000900	....	....	
11,400	57,000	.007900	.001000	....	....	
11,600	58,000	.008900	.001000	....	....	
11,800	59,000	.009750	.000850	....	....	
12,000	60,000	.010600	.000850	....	....	
12,400	62,000	.012400	.001800	....	....	
12,800	64,000	.014500	.002100	....	....	
13,200	66,000	.016900	.002400	....	....	
13,600	68,000	.019250	.002350	....	....	
14,000	70,000	.021500	.002250	....	....	
14,400	72,000	.023750	.002250	....	....	
14,800	74,000	.026300	.002550	....	....	
15,200	76,000	.029000	.002700	....	....	
15,600	78,000	.032300	.003300	....	....	
16,000	80,000	.036150	.003850	....	....	
16,400	82,000	.040600	.004450	....	....	
16,800	84,000	.046000	.005400	....	....	
17,200	86,000	.053250	.007250	....	....	
17,600	88,000	.061250	.008000	....	....	
18,000	90,000	.0700	.008750	....	....	
18,400	92,000	.1000	.0300	....	....	
18,600	93,000	.1400	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	93,000
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.2450
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.95 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.16

No. 3488.

Marks, $^{\text{32 Re J}}_{\text{T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000300	.000200	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000800	.000200	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7, 000	35, 000	.001150	.000200	0.	....	
8, 000	40, 000	.001350	.000200	0.	....	
9, 000	45, 000	.001550	.000200	....	....	Elastic limit.
9, 200	46, 000	.001850	.000300	....	....	
9, 400	47, 000	.002200	.000350	....	....	
9, 600	48, 000	.003500	.001300	....	....	
9, 800	49, 000	.004500	.001000	....	....	
10, 600	50, 000	.005250	.000750	....	....	
10, 200	51, 000	.006250	.001000	....	....	
10, 400	52, 000	.007150	.000900	....	....	
10, 600	53, 000	.007900	.000750	....	....	
10, 800	54, 000	.008600	.000700	....	....	
11, 000	55, 000	.009500	.000900	....	....	
11, 200	56, 000	.010500	.001000	....	....	
11, 400	57, 000	.011300	.000800	....	....	
11, 600	58, 000	.012050	.000750	....	....	
11, 800	59, 000	.013100	.001050	....	....	
12, 000	60, 000	.014150	.001050	....	....	
12, 400	62, 000	.016350	.002200	....	....	
12, 800	61, 000	.018800	.002450	....	....	
13, 200	66, 000	.020500	.001700	....	....	
13, 600	68, 000	.023000	.002500	....	....	
14, 000	70, 000	.025750	.002750	....	....	
14, 400	72, 000	.028550	.002800	....	....	
14, 800	74, 000	.031750	.003200	....	....	
15, 200	76, 000	.035350	.003600	....	....	
15, 600	78, 000	.039750	.001400	....	....	
16, 000	80, 000	.042150	.002400	....	....	
16, 400	82, 000	.051000	.008850	....	....	
16, 800	84, 000	.058250	.007250	....	....	
17, 200	86, 000	.0650	.006750	....	....	
17, 600	88, 000	.0850	.0200	....	....	
18, 000	90, 000	.1300	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	90, 000
Elastic limit per square inch of original section	do	45, 000
Elongation per inch after rupture	inch	0. 2350
Elongation per inch under strain at elastic limit	do	.001550
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43. 3
Position of rupture		″.95 from neck
Character of broken surface		silky
Elongation of inch sections		″.13, ″.34

No. 3489.

Marks, $\overset{32\ R_{60}\ J}{T_3\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

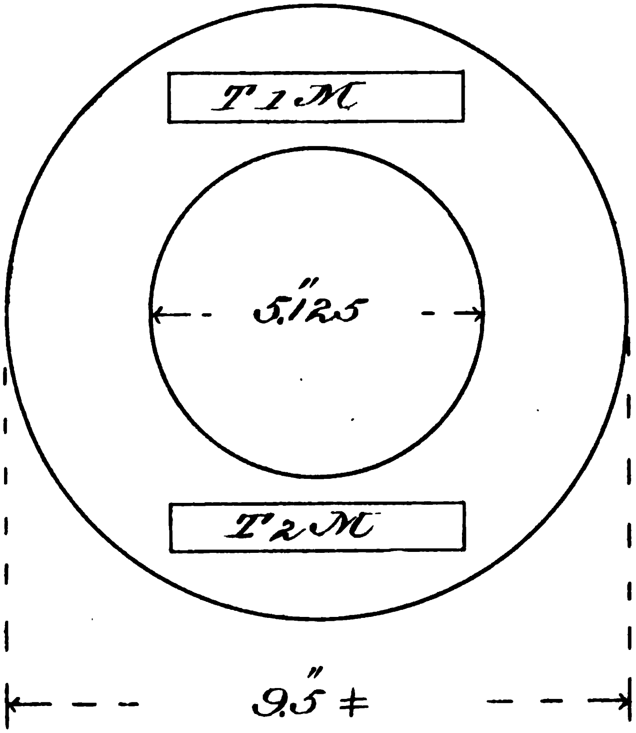
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
8,200	41,000	.001400	.000050	....	....	
8,400	42,000	.001450	.000050	....	....	
8,600	43,000	.001450	0.	....	....	
8,800	44,000	.001500	.000050	....	....	Elastic limit.
9,000	45,000	.001900	.000400	....	....	
9,200	46,000	.002600	.000700	....	....	
9,400	47,000	.003550	.000950	....	....	
9,600	48,000	.004500	.000950	....	....	
9,800	49,000	.005350	.000850	....	....	
10,000	50,000	.006100	.000750	....	....	
10,400	52,000	.008000	.001900	....	....	
10,800	54,000	.009750	.001750	....	....	
11,200	56,000	.011500	.001750	....	....	
11,600	58,000	.013500	.002000	....	....	
12,000	60,000	.015500	.002000	....	....	
12,400	62,000	.017300	.001800	....	....	
12,800	64,000	.019250	.001950	....	....	
13,200	66,000	.021600	.002350	....	....	
13,600	68,000	.024000	.002400	....	....	
14,000	70,000	.026400	.002400	....	....	
14,400	72,000	.029500	.003100	....	....	
14,800	74,000	.032750	.003250	....	....	
15,200	76,000	.036750	.004000	....	....	
15,600	78,000	.040750	.004000	....	....	
16,000	80,000	.046750	.006000	....	....	
16,400	82,000	.052500	.005750	....	....	
16,800	84,000	.0600	.0075	....	....	
17,200	86,000	.0750	.0150	....	....	
17,600	88,000	.1000	.0250	....	....	
17,840	89,200	.1350	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	89,200
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.2300
Elongation per inch under strain at elastic limit	do	.001500
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.70 from neck
Character of broken surface		silky
Elongation of inch sections		″.34*, ″.12

3.2 inch Steel B. L. Rifles

Trunnion Hoops

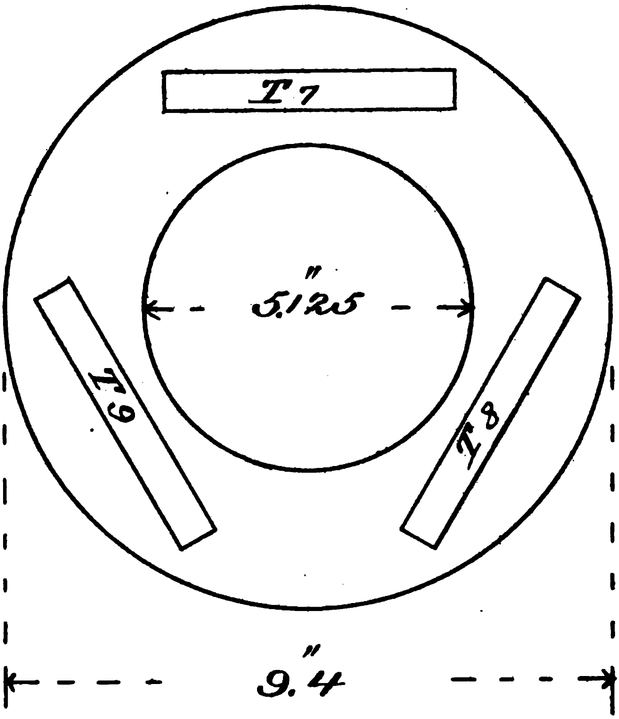


H Ex No 16 50, 1.

3.2 inch Steel B.L. Rifles

Trunnion Hoops

2nd hoop. No. 21



H Ex No 16 50, 1.

No. 3206.

Marks, $\underset{\mathrm{T}}{^{32}\mathrm{R}_{71}\ \mathrm{T\ H}}$,
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	**Initial load.**
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000200	.000100	0.	....	
3, 000	15, 000	.000450	.000250	0.	....	
4, 000	20, 000	.000650	.000200	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001050	.000200	0.	....	
7, 000	35, 000	.001200	.000150	0.	....	
8, 000	40, 000	.001350	.000150	0.	....	
9, 000	45, 000	.001500	.000150	....	....	
10, 000	50, 000	.001600	.000100	....	....	
10, 200	51, 000	.001650	.000050	....	....	
10, 400	52, 000	.001650	0.	....	....	
10, 600	53, 000	.001750	.000100	....	....	**Elastic limit.**
10, 800	54, 000	.004100	.002350	....	....	
11, 000	55, 000	.006000	.001900	....	....	
11, 200	56, 000	.007250	.001250	....	....	
11, 400	57, 000	.008250	.001000	....	....	
11, 600	58, 000	.009000	.000750	....	....	
11, 800	59, 000	.009900	.000900	....	....	
12, 000	60, 000	.010900	.001000	....	....	
12, 400	62, 000	.012850	.001950	....	....	
12, 800	64, 000	.014800	.001950	....	....	
13, 200	66, 000	.016800	.002000	....	....	
13, 600	68, 000	.019100	.002300	....	....	
14, 000	70, 000	.021150	.002050	....	....	
14, 400	72, 000	.023600	.002450	....	....	
14, 800	74, 000	.026000	.002400	....	....	
15, 200	76, 000	.028750	.002750	....	....	
15, 600	78, 000	.031600	.002850	....	....	
16, 000	80, 000	.035000	.003400	....	....	
16, 400	82, 000	.038750	.003750	....	....	
16, 800	84, 000	.043100	.004350	....	....	
17, 200	86, 000	.048250	.005150	....	....	
17, 600	88, 000	.053740	.005500	....	....	
18, 000	90, 000	.061250	.007500	....	....	
18, 400	92, 000	.0650	.0375	....	....	
18, 800	94, 000	.0850	.0200	....	....	
19, 170	95, 850	.1400	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 95, 850
Elastic limit per square inch of original section ....do ... 53, 000
Elongation per inch after rupture ....inch.. 0. 2000
Elongation per inch under strain at elastic limit ....do.. .001750
Reduction in diameter at point of rupture ....do.. .105
Reduction in area after rupture, per centum of original section 37. 1
Position of rupture ....″.80 from neck
Character of broken surface, granular, 55 per cent.; silky, 45 per cent. Opened cracks in surface of stem.
Elongation of inch sections ....″.29*, ″.11

No. 3207.

Marks, $^{32}\mathrm{B_n}\,{}^{\mathrm{TH}}_{\mathrm{T_9}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000700	.000250	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001250	.000100	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	Elastic limit.
10,600	53,000	.001900	.000150	....	....	
10,800	54,000	.004150	.002250	....	....	
11,000	55,000	.005500	.001350	....	....	
11,200	56,000	.006600	.001100	....	....	
11,400	57,000	.007650	.001050	....	....	
11,600	58,000	.008900	.001250	....	....	
11,800	59,000	.009600	.000700	....	....	
12,000	60,000	.010450	.000850	....	....	
12,400	62,000	.012100	.001650	....	....	
12,800	64,000	.014250	.002150	....	....	
13,200	66,000	.016000	.001750	....	....	
13,600	68,000	.018000	.002000	....	....	
14,000	70,000	.020250	.002250	....	....	
14,400	72,000	.022750	.002500	....	....	
14,800	74,000	.025000	.002250	....	....	
15,200	76,000	.027300	.002300	....	....	
15,600	78,000	.030250	.002950	....	....	
16,000	80,000	.033250	.003000	....	....	
16,400	82,000	.037050	.003800	....	....	
16,800	84,000	.041100	.004050	....	....	
17,200	86,000	.044850	.003750	....	....	
17,600	88,000	.051750	.006900	....	....	
18,000	90,000	.057750	.006000	....	....	
18,400	92,000	.0625	.004750	....	....	
18,800	94,000	.0750	.0125	....	....	
19,200	96,000	.1000	.0250	....	....	
19,280	96,400	.1300	,0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90,400
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1700
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.085
Reduction in area after rupture, per centum of original section		30.7
Position of rupture		1″.10 from neck

Character of broken surface, granular, 60 per cent.; silky, 40 per cent. Opened cracks in surface of stem.

Elongation of inch sections .... ″.19*, ″.15

No. 3336.

Marks, $\begin{matrix}32\ \mathrm{R_{26}\ T\ H}\\ .\ \mathrm{T_1\ M}\end{matrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	Elastic limit.
10,600	53,000	.001800	.000100	....	....	
10,800	54,000	.008500	.006700	....	....	
11,000	55,000	.010100	.001600	....	....	
11,200	56,000	.010650	.000550	....	....	
11,400	57,000	.011200	.000550	....	....	
11,600	58,000	.012100	.000900	....	....	
11,800	59,000	.013100	.001000	....	....	
12,000	60,000	.014250	.001150	....	....	
12,400	62,000	.016050	.001800	....	....	
12,800	64,000	.018100	.002050	....	....	
13,200	66,000	.020250	.002150	....	....	
13,600	68,000	.023000	.002750	....	....	
14,000	70,000	.025100	.002100	....	....	
14,400	72,000	.027500	.002400	....	....	
14,800	74,000	.030600	.003100	....	....	
15,200	76,000	.033750	.003150	....	....	
15,600	78,000	.037100	.003350	....	....	
16,000	80,000	.041500	.004400	....	....	
16,400	82,000	.646250	.004750	....	....	
16,800	84,000	.052000	.005750	....	....	
17,200	86,000	.0550	.0030	....	....	
17,600	88,000	.0600	.0050	....	....	
18,000	90,000	.0800	.0200	....	....	
18,400	92,000	.1000	.0200	....	....	
18,760	93,800	.1450	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	93,800
Elastic limit per square inch of original section	do	52,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.36

No. 3337.

Marks, $^{82}\frac{R_{xx}\ T\ H}{T_9\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001500	.000200	....	....	
10,000	50,000	.001650	.000150	....	....	Elastic limit.
10,200	51,000	.010750	.009100	....	....	
10,400	52,000	.011750	.001000	....	....	
10,600	53,000	.012300	.000550	....	....	
10,800	54,000	.013100	.000800	....	....	
11,000	55,000	.014050	.000950	....	....	
11,200	56,000	.015050	.001000	....	....	
11,400	57,000	.016000	.000950	....	....	
11,600	58,000	.017050	.001050	....	....	
11,800	59,000	.018000	.000950	....	....	
12,000	60,000	.019000	.001000	....	....	
12,400	62,000	.021300	.002800	....	....	
12,800	64,000	.023750	.002450	....	....	
13,200	66,000	.026050	.002300	....	....	
13,600	68,000	.029000	.002950	....	....	
14,000	70,000	.031850	.002850	....	....	
14,400	72,000	.035600	.003750	....	....	
14,800	74,000	.039000	.003400	....	....	
15,200	76,000	.043000	.004000	....	....	
15,600	78,000	.047500	.004500	....	....	
16,000	80,000	.053250	.005750	....	....	
16,400	82,000	.0575	.004250	....	....	
16,800	84,000	.0625	.0050	....	....	
17,200	86,000	.0800	.0175	....	....	
17,600	88,000	.0950	.0150	....	....	
18,000	90,000	.1100	.0150	....	....	
18,180	90,900	.1600	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..
Elastic limit per square inch of original section ....do....
Elongation per inch after rupture................................inch..
Elongation per inch under strain at elastic limit................................do....
Reduction in diameter at point of rupture ....do....
Reduction in area after rupture, per centum of original section................................
Position of rupture................................1″. 10 from
Character of broken surface ....
Elongation of inch sections ....″.30

No. 3273.

Marks, $^{32}\genfrac{}{}{0pt}{}{\text{B}_{r}\ \text{T H}}{\text{T}_{1}\ \text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	
10,800	54,000	.001850	.000050	....	....	Elastic limit.
11,000	55,000	.002000	.000150	....	....	
11,200	56,000	.006100	.004100	....	....	
11,400	57,000	.007300	.001200	....	....	
11,600	58,000	.008250	.000950	....	....	
11,800	59,000	.009150	.000900	....	....	
12,000	60,000	.010150	.001000	....	....	
12,400	62,000	.011650	.001500	....	....	
12,800	64,000	.013600	.001950	....	....	
13,200	66,000	.015500	.001900	....	....	
13,600	68,000	.017500	.002000	....	....	
14,000	70,000	.019600	.002100	....	....	
14,400	72,000	.021900	.002300	....	....	
14,800	74,000	.024000	.002100	....	....	
15,200	76,000	.026750	.002750	....	....	
15,600	78,000	.029250	.002500	....	....	
16,000	80,000	.032100	.002850	....	....	
16,400	82,000	.035650	.003550	....	....	
16,800	84,000	.039500	.003850	....	....	
17,200	86,000	.043700	.004200	....	....	
17,600	88,000	.049500	.005800	....	....	
18,000	90,000	.0550	.0055	....	....	
18,400	92,000	.0600	.0050	....	....	
18,800	94,000	.0700	.0100	....	....	
19,200	96,000	.0900	.0200	....	....	
19,520	97,600	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	97,600
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		1″.00 from neck
Character of broken surface		silky
Elongation of inch sections		″.17, ″.31*

No. 3274.

Marks, $^{82}\genfrac{}{}{0pt}{}{B_{27}\ T\ H}{T_2\ M}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200	0.	....	
2,000	10,000	.000350	.000150	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001500	.000150	....	....	
10,000	50,000	.001650	.000150	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	Elastic limit.
10,600	53,000	.001900	.000150	....	....	
10,800	54,000	.002050	.000150	....	....	
11,000	55,000	.002600	.000550	....	....	
11,200	56,000	.005150	.002550	....	....	
11,400	57,000	.006600	.001450	....	....	
11,600	58,000	.007600	.001000	....	....	
11,800	59,000	.008600	.001000	....	....	
12,000	60,000	.009650	.001050	....	....	
12,400	62,000	.011150	.001500	....	....	
12,800	64,000	.012800	.001650	....	....	
13,200	66,000	.014800	.002000	....	....	
13,600	68,000	.016600	.001800	....	....	
14,000	70,000	.018600	.002000	....	....	
14,400	72,000	.020850	.002250	....	....	
14,800	74,000	.023250	.002400	....	....	
15,200	76,000	.025600	.002350	....	....	
15,600	78,000	.028500	.002900	....	....	
16,000	80,000	.031850	.003350	....	....	
16,400	82,000	.035100	.003250	....	....	
16,800	84,000	.038500	.003400	....	....	
17,200	86,000	.042300	.003800	....	....	
17,600	88,000	.047250	.004950	....	....	
18,000	90,000	.053400	.006150	....	....	
18,400	92,000	.0575	.0041	....	....	
18,800	94,000	.0675	.0100	....	....	
19,200	96,000	.0900	.0225	....	....	
19,530	97,650	.1350	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	97,650
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.11, ″.31*

No. 3347.

Marks, $^{32\ R_{ss}\ T\ H}_{T_1\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	
9,600	48,000	.001650	.000050	....	....	Elastic limit.
9,800	49,000	.001900	.000250	....	....	
10,000	50,000	.006250	.004350	....	....	
10,200	51,000	.007000	.000750	....	....	
10,400	52,000	.007750	.000750	....	....	
10,600	53,000	.008600	.000850	....	....	
10,800	54,000	.009500	.000900	....	....	
11,000	55,000	.010500	.001000	....	....	
11,200	56,000	.011300	.000800	....	....	
11,400	57,000	.012350	.001050	....	....	
11,600	58,000	.013200	.000850	....	....	
11,800	59,000	.014000	.000800	....	....	
12,000	60,000	.015050	.001050	....	....	
12,400	62,000	.017000	.001950	....	....	
12,800	64,000	.019150	.002150	....	....	
13,200	66,000	.021750	.002600	....	....	
13,600	68,000	.024500	.002750	....	....	
14,000	70,000	.027000	.002500	....	....	
14,400	72,000	.030000	.003000	....	....	
14,800	74,000	.033400	.003400	....	....	
15,200	76,000	.036750	.003350	....	....	
15,600	78,000	.041050	.004300	....	....	
16,000	80,000	.046650	.005600	....	....	
16,400	82,000	.053000	.006350	....	....	
16,800	84,000	.0575	.0045	....	....	
17,200	86,000	.0650	.0075	....	....	
17,600	88,000	.0900	.0250	....	....	
17,890	89,450	.1450	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section............pounds..	89,450
Elastic limit per square inch of original section............do....	48,000
Elongation per inch after rupture............inch..	0.1800
Elongation per inch under strain at elastic limit............do....	.001650
Reduction in diameter at point of rupture............do....	.085
Reduction in area after rupture, per centum of original section............	30.7

Position of rupture............1".05 from neck
Character of broken surface, granular; flaky spot at circumference. Opened crack in stem near point of rupture.
Elongation of inch sections............".15, ".21*

No. 3348.

Marks, $^{32}\frac{\mathrm{R}_{36}\ \mathrm{T}\ \mathrm{H}}{\mathrm{T}_2\ \mathrm{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	0.	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	Elastic limit.
9,600	48,000	.091800	.000200	....	....	
9,800	49,000	.006000	.004200	....	....	
10,000	50,000	.007250	.001250	....	....	
10,200	51,000	.008000	.000750	....	....	
10,400	52,000	.009000	.001000	....	....	
10,600	53,000	.009600	.000600	....	....	
10,800	54,000	.010350	.000750	....	....	
11,000	55,000	.011100	.000750	....	....	
11,200	56,000	.012100	.001000	....	....	
11,400	57,000	.013100	.001000	....	....	
11,600	58,000	.013900	.000800	....	....	
11,800	59,000	.015000	.001100	....	....	
12,000	60,000	.016250	.001250	....	....	
12,400	62,000	.018500	.002250	....	....	
12,800	64,000	.020600	.002100	....	....	
13,200	66,000	.023250	.002650	....	....	
13,600	68,000	.025850	.002600	....	....	
14,000	70,000	.028800	.002950	....	....	
14,400	72,000	.031900	.003100	....	....	
14,800	74,000	.035600	.003700	....	....	
15,200	76,000	.039350	.003750	....	....	
15,600	78,000	.043800	.004450	....	....	
16,000	80,000	.049500	.005700	....	....	
16,400	82,000	.056600	.007100	....	....	
16,800	84,000	.0625	.0059	....	....	
17,200	86,000	.0800	.0175	....	....	
17,600	88,000	.0950	.0150	....	....	
17,880	89,400	.1500	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89,400
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	0.75
Reduction in area after rupture, per centum of original section		27.4
Position of rupture		″.90 from neck
Character of broken surface		granular; silky spot at circumference
Elongation of inch sections		″.22*, ″.16

No. 3206.

Marks, $^{32\,\mathrm{R}\frac{1}{4}\,\mathrm{T\,H}}_{\mathrm{T}_3}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000200	.000100	0.	....	
3, 000	15, 000	.000450	.000250	0.	....	
4, 000	20, 000	.000650	.000200	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001050	.000200	0.	....	
7, 000	35, 000	.001200	.000150	0.	....	
8, 000	40, 000	.001350	.000150	0.	....	
9, 000	45, 000	.001500	.000150	....	....	
10, 000	50, 000	.001600	.000100	....	....	
10, 200	51, 000	.001650	.000050	....	....	
10, 400	52, 000	.001650	0.	....	....	
10, 600	53, 000	.001750	.000100	....	....	Elastic limit.
10, 800	54, 000	.004100	.002350	....	....	
11, 000	55, 000	.006000	.001900	....	....	
11, 200	56, 000	.007250	.001250	....	....	
11, 400	57, 000	.008250	.001000	....	....	
11, 600	58, 000	.009000	.000750	....	....	
11, 800	59, 000	.009900	.000900	....	....	
12, 000	60, 000	.010900	.001000	....	....	
12, 400	62, 000	.012850	.001950	....	....	
12, 800	64, 000	.014800	.001950	....	....	
13, 200	66, 000	.016800	.002000	....	....	
13, 600	68, 000	.019100	.002300	....	....	
14, 000	70, 000	.021150	.002050	....	....	
14, 400	72, 000	.023600	.002450	....	....	
14, 800	74, 000	.026000	.002400	....	....	
15, 200	76, 000	.028750	.002750	....	....	
15, 600	78, 000	.031600	.002850	....	....	
16, 000	80, 000	.035000	.003400	....	....	
16, 400	82, 000	.038750	.003750	....	....	
16, 800	84, 000	.043100	.004350	....	....	
17, 200	86, 000	.048250	.005150	....	....	
17, 600	88, 000	.053740	.005500	....	....	
18, 000	90, 000	.061250	.007500	....	....	
18, 400	92, 000	.0650	.0375	....	....	
18, 800	94, 000	.0850	.0200	....	....	
19, 170	95, 850	.1400	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	95, 850
Elastic limit per square inch of original section	do ...	53, 000
Elongation per inch after rupture	inch..	0. 2000
Elongation per inch under strain at elastic limit	do..	.001750
Reduction in diameter at point of rupture	do..	.105
Reduction in area after rupture, per centum of original section		37. 1
Position of rupture		″.80 from neck

Character of broken surface, granular, 55 per cent.; silky, 45 per cent. Opened cracks in surface of stem.

Elongation of inch sections	″.29*, ″.11

No. 3207.

Marks, $^{32\ \mathrm{Bn}\ \mathrm{TH}}_{\quad\ \mathrm{T}_8}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000700	.000250	0.	....	
5, 000	25, 000	.000850	.000150	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001250	.000100	0.	....	
9, 000	45, 000	.001450	.000200	....	....	
10, 000	50, 000	.001650	.000200	....	....	
10, 200	51, 000	.001700	.000050	....	....	
10, 400	52, 000	.001750	.000050	....	....	Elastic limit.
10, 600	53, 000	.001900	.000150	....	....	
10, 800	54, 000	.004150	.002250	....	....	
11, 000	55, 000	.005500	.001350	....	....	
11, 200	56, 000	.006600	.001100	....	....	
11, 400	57, 000	.007650	.001050	....	....	
11, 600	58, 000	.008900	.001250	....	....	
11, 800	59, 000	.009600	.000700	....	....	
12, 000	60, 000	.010450	.000850	....	....	
12, 400	62, 000	.012100	.001650	....	....	
12, 800	64, 000	.014250	.002150	....	....	
13, 200	66, 000	.016000	.001750	....	....	
13, 600	68, 000	.018000	.002000	....	....	
14, 000	70, 000	.020250	.002250	....	....	
14, 400	72, 000	.022750	.002500	....	....	
14, 800	74, 000	.025000	.002250	....	....	
15, 200	76, 000	.027300	.002300	....	....	
15, 600	78, 000	.030250	.002950	....	....	
16, 000	80, 000	.033250	.003000	....	....	
16, 400	82, 000	.037050	.003800	....	....	
16, 800	84, 000	.041100	.004050	....	....	
17, 200	86, 000	.044850	.003750	....	....	
17, 600	88, 000	.051750	.006900	....	....	
18, 000	90, 000	.057750	.006000	....	....	
18, 400	92, 000	.0625	.004750	....	....	
18, 800	94, 000	.0750	.0125	....	....	
19, 200	96, 000	.1000	.0250	....	....	
19, 280	96, 400	.1300	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90, 400
Elastic limit per square inch of original section	do....	52, 000
Elongation per inch after rupture	inch..	0. 1700
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.085
Reduction in area after rupture, per centum of original section		30. 7
Position of rupture		1″.10 from neck

Character of broken surface, granular, 60 per cent.; silky, 40 per cent. Opened cracks in surface of stem.

Elongation of inch sections .... ″.19*, ″.15

No. 3336.

Marks, $^{32}\frac{\mathrm{R_{..}\ T\ H}}{.\ \mathrm{T_1\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	Elastic limit.
10,600	53,000	.001800	.000100	....	....	
10,800	54,000	.008500	.006700	....	....	
11,000	55,000	.010100	.001600	....	....	
11,200	56,000	.010650	.000550	....	....	
11,400	57,000	.011200	.000550	....	....	
11,600	58,000	.012100	.000900	....	....	
11,800	59,000	.013100	.001000	....	....	
12,000	60,000	.014250	.001150	....	....	
12,400	62,000	.016050	.001800	....	....	
12,800	64,000	.018100	.002050	....	....	
13,200	66,000	.020250	.002150	....	....	
13,600	68,000	.023000	.002750	....	....	
14,000	70,000	.025100	.002100	....	....	
14,400	72,000	.027500	.002400	....	....	
14,800	74,000	.030600	.003100	....	....	
15,200	76,000	.033750	.003150	....	....	
15,600	78,000	.037100	.003350	....	....	
16,000	80,000	.041500	.004400	....	....	
16,400	82,000	.646250	.004750	....	....	
16,800	84,000	.052000	.005750	....	....	
17,200	86,000	.0550	.0030	....	....	
17,600	88,000	.0600	.0050	....	....	
18,000	90,000	.0800	.0200	....	....	
18,400	92,000	.1000	.0200	....	....	
18,760	93,800	.1450	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93,800
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.36

No. 3337.

Marks, $^{32}\frac{R_{26}\ T\ H}{T_2\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.		
2,000	10,000	.000250	.000150	0.		
3,000	15,000	.000400	.000150	0.		
4,000	20,000	.000550	.000150	0.		
5,000	25,000	.000750	.000200	0.		
6,000	30,000	.000950	.000200	0.		
7,000	35,000	.001100	.000150	0.		
8,000	40,000	.001300	.000200	0.		
9,000	45,000	.001500	.000200			
10,000	50,000	.001650	.000150			Elastic limit.
10,200	51,000	.010750	.009100			
10,400	52,000	.011750	.001000			
10,600	53,000	.012300	.000550			
10,800	54,000	.013100	.000800			
11,000	55,000	.014050	.000950			
11,200	56,000	.015050	.001000			
11,400	57,000	.016000	.000950			
11,600	58,000	.017050	.001050			
11,800	59,000	.018000	.000950			
12,000	60,000	.019000	.001000			
12,400	62,000	.021300	.002300			
12,800	64,000	.023750	.002450			
13,200	66,000	.026050	.002300			
13,600	68,000	.029000	.002950			
14,000	70,000	.031850	.002850			
14,400	72,000	.035600	.003750			
14,800	74,000	.039000	.003400			
15,200	76,000	.043000	.004000			
15,600	78,000	.047500	.004500			
16,000	80,000	.053250	.005750			
16,400	82,000	.0575	.004250			
16,800	84,000	.0625	.0050			
17,200	86,000	.0800	.0175			
17,600	88,000	.0950	.0150			
18,000	90,000	.1100	.0150			
18,180	90,900	.1600	.0500			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90,900
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2250
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		37.1
Position of rupture		1".10 from neck
Character of broken surface		silky
Elongation of inch sections		".30*, ".15

No. 3273.

Marks, $^{32}\genfrac{}{}{0pt}{}{R_{7}\ T\ H}{T_{1}\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	
10,800	54,000	.001850	.000050	....	....	Elastic limit.
11,000	55,000	.002000	.000150	....	....	
11,200	56,000	.006100	.004100	....	....	
11,400	57,000	.007300	.001200	....	....	
11,600	58,000	.008250	.000950	....	....	
11,800	59,000	.009150	.000900	....	....	
12,000	60,000	.010150	.001000	....	....	
12,400	62,000	.011650	.001500	....	....	
12,800	64,000	.013600	.001950	....	....	
13,200	66,000	.015500	.001900	....	....	
13,600	68,000	.017500	.002000	....	....	
14,000	70,000	.019600	.002100	....	....	
14,400	72,000	.021900	.002300	....	....	
14,800	74,000	.624000	.002100	....	....	
15,200	76,000	.026750	.002750	....	....	
15,600	78,000	.029250	.002500	....	....	
16,000	80,000	.032100	.002850	....	....	
16,400	82,000	.035650	.003550	....	....	
16,800	84,000	.039500	.003850	....	....	
17,200	86,000	.043700	.004200	....	....	
17,600	88,000	.049500	.005800	....	....	
18,000	90,000	.0550	.0055	....	....	
18,400	92,000	.0600	.0050	....	....	
18,800	94,000	.0700	.0100	....	....	
19,200	96,000	.0900	.0200	....	....	
19,520	97,600	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	97,600
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		1″.00 from neck
Character of broken surface		silky
Elongation of inch sections		″.17, ″.31

No. 3274.

Marks, $\overset{82\,\mathrm{R}_{57}\ \mathrm{T\ H}}{\mathrm{T,\ M}}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200	0.	....	
2,000	10,000	.000350	.000150	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001500	.000150	....	....	
10,000	50,000	.001650	.000150	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	Elastic limit.
10,600	53,000	.001900	.000150	....	....	
10,800	54,000	.002050	.000150	....	....	
11,000	55,000	.002600	.000550	....	....	
11,200	56,000	.005150	.002550	....	....	
11,400	57,000	.006600	.001450	....	....	
11,600	58,000	.007600	.001000	....	....	
11,800	59,000	.008600	.001000	....	....	
12,000	60,000	.009650	.001050	....	....	
12,400	62,000	.011150	.001500	....	....	
12,800	64,000	.012800	.001650	....	....	
13,200	66,000	.014800	.002000	....	....	
13,600	68,000	.016600	.001800	....	....	
14,000	70,000	.018600	.002000	....	....	
14,400	72,000	.020850	.002250	....	....	
14,800	74,000	.023250	.002400	....	....	
15,200	76,000	.025600	.002350	....	....	
15,600	78,000	.028500	.002900	....	....	
16,000	80,000	.031850	.003350	....	....	
16,400	82,000	.035100	.003250	....	....	
16,800	84,000	.038500	.003400	....	....	
17,200	86,000	.042300	.003800	....	....	
17,600	88,000	.047250	.004950	....	....	
18,000	90,000	.053400	.006150	....	....	
18,400	92,000	.0575	.0041	....	....	
18,800	94,000	.0675	.0100	....	....	
19,200	96,000	.0900	.0225	....	....	
19,530	97,650	.1350	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	97,650
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.11, ″.31*

No. 3347.

Marks, $\genfrac{}{}{0pt}{}{32\ \mathrm{R_{ee}\ T\ H}}{\mathrm{T_1\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	
9,600	48,000	.001650	.000050	....	....	Elastic limit.
9,800	49,000	.001900	.000250	....	....	
10,000	50,000	.006250	.004350	....	....	
10,200	51,000	.007000	.000750	....	....	
10,400	52,000	.007750	.000750	....	....	
10,600	53,000	.008600	.000850	....	....	
10,800	54,000	.009500	.000900	....	....	
11,000	55,000	.010500	.001000	....	....	
11,200	56,000	.011300	.000800	....	....	
11,400	57,000	.012350	.001050	....	....	
11,600	58,000	.013200	.000850	....	....	
11,800	59,000	.014000	.000800	....	....	
12,000	60,000	.015050	.001050	....	....	
12,400	62,000	.017000	.001950	....	....	
12,800	64,000	.019150	.002150	....	....	
13,200	66,000	.021750	.002600	....	....	
13,600	68,000	.024500	.002750	....	....	
14,000	70,000	.027000	.002500	....	....	
14,400	72,000	.030000	.003000	....	....	
14,800	74,000	.033400	.003400	....	....	
15,200	76,000	.036750	.003350	....	....	
15,600	78,000	.041050	.004300	....	....	
16,000	80,000	.046650	.005600	....	....	
16,400	82,000	.053000	.006350	....	....	
16,800	84,000	.0575	.0045	....	....	
17,200	86,000	.0650	.0075	....	....	
17,600	88,000	.0900	.0250	....	....	
17,890	89,450	.1450	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	89,450
Elastic limit per square inch of original section	do	48,000
Elongation per inch after rupture	inch	0.1800
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.085
Reduction in area after rupture, per centum of original section		30.7
Position of rupture		1″.05 from neck

Character of broken surface, granular; flaky spot at circumference. Opened crack in stem near point of rupture.

Elongation of inch sections .... ″.15, ″.21*

No. 3348.

Marks, $^{32}\frac{R_{s}\ T\ H}{T_{2}\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000200	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000650	.000200	0.	....	
5, 000	25, 000	.000800	.000150	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7, 000	35, 000	.001150	.000200	0.	....	
8, 000	40, 000	.001350	.000200	0.	....	
9, 000	45, 000	.001500	.000150	0.	....	
9, 200	46, 000	.001550	.000050	....	....	
9, 400	47, 000	.001600	.000050	....	....	Elastic limit.
9, 600	48, 000	.091800	.000200	....	....	
9, 800	49, 000	.006000	.004200	....	....	
10, 000	50, 000	.007250	.001250	....	....	
10, 200	51, 000	.008000	.000750	....	....	
10, 400	52, 000	.009000	.001000	....	....	
10, 000	53, 000	.009600	.000600	....	....	
10, 800	54, 000	.010350	.000750	....	....	
11, 000	55, 000	.011100	.000750	....	....	
11, 200	56, 000	.012100	.001000	....	....	
11, 400	57, 000	.013100	.001000	....	....	
11, 600	56, 000	.013900	.000800	....	....	
11, 800	59, 000	.015000	.001100	....	....	
12, 000	60, 000	.016250	.001250	....	....	
12, 400	62, 000	.018500	.002250	....	....	
12, 800	64, 000	.020600	.002100	....	....	
13, 200	66, 000	.023250	.002650	....	....	
13, 600	68, 000	.025850	.002600	....	....	
14, 000	70, 000	.028800	.002950	....	....	
14, 400	72, 000	.031900	.003100	....	....	
14, 800	74, 000	.035600	.003700	....	....	
15, 200	76, 000	.039350	.003750	....	....	
15, 600	78, 000	.043800	.004450	....	....	
16, 000	80, 000	.049500	.005700	....	....	
16, 400	82, 000	.056600	.007100	....	....	
16, 800	84, 000	.0625	.0059	....	....	
17, 200	86, 0 0	.0800	.0175	....	....	
17, 600	88, 000	.0950	.0150	....	....	
17, 880	89, 400	.1500	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds..	89,400
Elastic limit per square inch of original section..........do....	47,000
Elongation per inch after rupture..........inch..	0.1900
Elongation per inch under strain at elastic limit..........do....	.001600
Reduction in diameter at point of rupture..........do....	0.75
Reduction in area after rupture, per centum of original section..........	27.4
Position of rupture..........	″.90 from neck
Character of broken surface..........	granular; silky spot at circumference
Elongation of inch sections..........	″.22*, ″.16

No. 3317.

Marks, $^{32}\mathrm{R}_{21}\,\substack{\mathrm{T\;H}\\ \mathrm{T}_1\,\mathrm{M}}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000250	.000100	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000700	.000150	0.	....	
6,000	30,000	.000900	.000200	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001200	.000150	0.	....	
9,000	45,000	.001350	.000150	....	....	
9,200	46,000	.001450	.000100	....	....	
9,400	47,000	.001500	.000050	....	....	
9,600	48,000	.001550	.000050	....	....	Elastic limit.
9,800	49,000	.002350	.000800	....	....	
10,000	50,000	.005200	.002850	....	....	
10,200	51,000	.006000	.000800	....	....	
10,400	52,000	.006750	.000750	....	....	
10,600	53,000	.007600	.000850	....	....	
10,800	54,000	.008500	.000900	....	....	
11,000	55,000	.009300	.000800	....	....	
11,200	56,000	.010500	.001200	....	....	
11,400	57,000	.011250	.000750	....	....	
11,600	58,000	.012250	.001000	....	....	
11,800	59,000	.013250	.001000	....	....	
12,000	60,000	.014550	.001300	....	....	
12,400	62,000	.016500	.001950	....	....	
12,800	64,000	.018900	.002400	....	....	
13,200	66,000	.021500	.002600	....	....	
13,600	68,000	.024000	.002500	....	....	
14,000	70,000	.027000	.003000	....	....	
14,400	72,000	.029550	.002550	....	....	
14,800	74,000	.032750	.003200	....	....	
15,200	76,000	.036300	.003550	....	....	
15,600	78,000	.041050	.004750	....	....	
16,000	80,000	.046800	.005750	....	....	
16,400	82,000	.052250	.005450	....	....	
16,800	84,000	.060500	.008250	....	....	
17,200	86,000	.0700	.0095	....	....	
17,600	88,000	.0900	.0200	....	....	
17,990	89,950	.1450	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	89,950
Elastic limit per square inch of original section ....do....	48,000
Elongation per inch after rupture ....inch..	0.2550
Elongation per inch under strain at elastic limit ....do....	.001550
Reduction in diameter at point of rupture ....do....	.124
Reduction in area after rupture, per centum of original section	43.3
Position of rupture	1″.05 from neck
Character of broken surface	silky
Elongation of inch sections	″.32*. ″.19

No. 3318.

Marks, $\overset{32\,R,\,T\,H}{T,\,M}$
Diameter, ".504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000400	.000150	0.	....	
4, 000	20, 000	.000550	.000150	0.	....	
5, 000	25, 000	.000700	.000150	0.	....	
6, 000	30, 000	.000850	.000150	0.	....	
7, 000	35, 000	.001050	.000200	0.	....	
8, 000	40, 000	.001250	.000200	0.	....	
9, 000	45, 000	.001400	.000150	....	....	
9, 200	46, 000	.001450	.000050	....	....	
9, 400	47, 000	.001500	.000050	....	....	
9, 600	48, 000	.001550	.000050	....	....	Elastic limit.
9, 800	49, 000	.001700	.000150	....	....	
10, 000	50, 000	.005000	.003300	....	....	
10, 200	51, 900	.006000	.001000	....	....	
10, 400	52, 000	.006750	.000750	....	....	
10, 600	53, 000	.007400	.000650	....	....	
10, 800	54, 000	.008150	.000750	....	....	
11, 000	55, 000	.008850	.000700	....	....	
11, 200	56, 000	.010000	.001150	....	....	
11, 400	57, 000	.011000	.000100	....	....	
11, 600	58, 000	.011900	.000900	....	....	
11, 800	59, 000	.012700	.000800	....	....	
12, 000	60, 000	.014000	.001300	....	....	
12, 400	62, 000	.015850	.001850	....	....	
12, 800	64, 000	.018050	.002200	....	....	
13, 200	66, 000	.020350	.002300	....	....	
13, 600	68, 000	.022600	.002250	....	....	
14, 000	70, 000	.025300	.002700	....	....	
14, 400	72, 000	.028250	.002950	....	....	
14, 800	74, 000	.031500	.003250	....	....	
15, 200	76, 000	.034600	.003100	....	....	
15, 600	78, 000	.039000	.004400	....	....	
16, 000	80, 000	.043750	.004750	....	....	
16, 400	82, 000	.048900	.005150	....	....	
16, 800	84, 000	.055500	.006600	....	....	
17, 200	86, 000	.0650	.0095	....	....	
17, 600	88, 000	.0800	.0150	....	....	
18, 000	90, 000	.1000	.0200	....	....	
18, 230	91, 150	.1450	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91, 150
Elastic limit per square inch of original section	do....	48, 000
Elongation per inch after rupture	inch..	0. 2600
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		46. 2
Position of rupture		1". 15 from neck
Character of broken surface		silky
Elongation of inch sections		". 20, ". 32*

No. 3319.

Marks, $\overset{82\ \text{Rss T H}}{\text{T, M}}$
Diameter, ".504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000650	.000200	0.	....	
5, 000	25, 000	.000800	.000150	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7, 000	35, 000	.001150	.000200	0.	....	
8, 000	40, 000	.001350	.000200	0.	....	
9, 000	45, 000	.001550	.000200	....	....	
10, 000	50, 000	.001700	.000150	....	....	
10, 200	51, 000	.001750	.000050	....	....	
10, 400	52, 000	.001800	.000050	....	....	Elastic limit.
10, 600	53, 000	.007500	.005700	....	....	
10, 800	54, 000	.008000	.000500	....	....	
11, 000	55, 000	.008600	.000600	....	....	
11, 200	56, 000	.009550	.000950	....	....	
11, 400	57, 000	.010350	.000800	....	....	
11, 600	58, 000	.011250	.000900	....	....	
11, 800	59, 000	.012250	.001000	....	....	
12, 000	60, 000	.013100	.000850	....	....	
12, 400	62, 000	.015000	.001900	....	....	
12, 800	64, 000	.017000	.002000	....	....	
18, 200	66, 000	.019250	.002250	....	....	
13, 600	68, 000	.021500	.002250	....	....	
14, 000	70, 000	.023750	.002250	....	....	
14, 400	72, 000	.026600	.002850	....	....	
14, 800	74, 000	.029500	.002900	....	....	
15, 200	76, 000	.033500	.004000	....	....	
15, 600	78, 000	.036500	.003000	....	....	
16, 000	80, 000	.040250	.003750	....	....	
16, 400	82, 000	.045300	.005050	....	....	
16, 800	84, 000	.051000	.005700	....	....	
17, 200	86, 000	.057750	.006750	....	....	
17, 600	88, 000	.0650	.007250	....	....	
18, 000	90, 000	.0850	.0200	....	....	
18, 400	92, 000	.1050	.0200	....	....	
18, 580	92, 900	.1550	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	92, 900
Elastic limit per square inch of original section	do	52, 000
Elongation per inch after rupture	inch	0. 2150
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		87. 1
Position of rupture		".75 from neck
Character of broken surface		silky
Elongation of inch sections		".14, ".29

No. 3320.

Marks, $^{32}\genfrac{}{}{0pt}{}{R_{28}\ T\ H}{T_2\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001400	.000100	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	Elastic limit.
10,600	53,000	.001900	.000200	....	....	
10,800	54,000	.007250	.005350	....	....	
11,000	55,000	.007750	.000500	....	....	
11,200	56,000	.008550	.000800	....	....	
11,400	57,000	.009500	.000950	....	....	
11,600	58,000	.010350	.000850	....	....	
11,800	59,000	.011250	.000900	....	....	
12,000	60,000	.012200	.000950	....	....	
12,400	62,000	.014000	.001800	....	....	
12,800	64,000	.016000	.002000	....	....	
13,200	66,000	.018400	.002400	....	....	
13,600	68,000	.020600	.002200	....	....	
14,000	70,000	.022750	.002250	....	....	
14,400	72,000	.025100	.002350	....	....	
14,800	74,000	.027850	.002750	....	....	
15,200	76,000	.030600	.002750	....	....	
15,600	78,000	.034100	.003500	....	....	
16,000	80,000	.038050	.003950	....	....	
16,400	82,000	.042750	.004700	....	....	
16,800	84,000	.047850	.005100	....	....	
17,200	86,000	.054000	.006150	....	....	
17,600	88,000	.062500	.008500	....	....	
18,000	90,000	.0800	.0175	....	....	
18,400	92,000	.0950	.0150	....	....	
18,720	93,600	.1400	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	89,900
Elastic limit per square inch of original section	do	48,000
Elongation per inch after rupture	inch	0.2050
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		87.1
Position of rupture		1″.15 from neck
Character of broken surface		silky
Elongation of inch sections		″.21*, ″.20*

No. 3275.

Marks, $^{32}\,\frac{R_{60}\ T}{T_1\ \ M}\ H$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001300	.000100	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	
9,600	48,000	.001650	.000050	....	....	Elastic limit.
9,800	49,000	.002000	.000350	....	....	
10,000	50,000	.006500	.004500	....	....	
10,200	51,000	.007100	.000600	....	....	
10,400	52,000	.007900	.000800	....	....	
10,600	53,000	.008750	.000850	....	....	
10,800	54,000	.009550	.000800	....	....	
11,000	55,000	.010350	.000800	....	....	
11,200	56,000	.011350	.001000	....	....	
11,400	57,000	.012300	.000950	....	....	
11,600	58,000	.013350	.001050	....	....	
11,800	59,000	.014600	.001250	....	....	
12,000	60,000	.016000	.001400	....	....	
12,400	62,000	.018400	.002400	....	....	
12,800	64,000	.020500	.002100	....	....	
13,200	66,000	.022400	.001900	....	....	
13,600	68,000	.024800	.002400	....	....	
14,000	70,000	.027250	.002450	....	....	
14,400	72,000	.030600	.003350	....	....	
14,800	74,000	.034100	.003500	....	....	
15,200	76,000	.037750	.003650	....	....	
15,600	78,000	.042000	.004250	....	....	
16,000	80,000	.047350	.005350	....	....	
16,400	82,000	.053750	.006400	....	....	
16,800	84,000	.0575	.003750	....	....	
17,200	86,000	.0650	.0075	....	....	
17,600	88,000	.0900	.0250	....	....	
17,980	89,900	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 89,900
Elastic limit per square inch of original section....................do.... 48,000
Elongation per inch after rupture....................inch.. 0.2050
Elongation per inch under strain at elastic limit....................do.... .001650
Reduction in diameter at point of rupture....................do.... .104
Reduction in area after rupture, per centum of original section.................... 37.1
Position of rupture....................:1″.15 from neck
Character of broken surface....................silky
Elongation of inch sections....................″.21*, ″.20*

No. 3276.

Marks, $^{32}\frac{\text{R.}}{\text{T,}}\frac{\text{T H}}{\text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000650	.000200	0.	....	
5, 000	25, 000	.000800	.000150	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7, 000	35, 000	.001150	.000200	0.	....	
8, 000	40, 000	.001300	.000150	0.	....	
9, 000	45, 000	.001450	.000150	....	....	
9, 200	46, 000	.001500	.000050	....	....	
9, 400	47, 000	.001550	.000050	....	....	
9, 600	48, 000	.001550	0.	....	....	
9, 800	49, 000	.001600	.000050	....	....	
10, 000	50, 000	.001650	.000050	....	....	
10, 200	51, 000	.001700	.000050	....	....	Elastic limit.
10, 400	52, 000	.006000	.004300	....	....	
10, 600	53, 000	.006750	.000750	....	....	
10, 800	54, 000	.007600	.000850	....	....	
11, 000	55, 000	.008400	.000800	....	....	
11, 200	56, 000	.009250	.000850	....	....	
11, 400	57, 000	.010000	.000750	....	....	
11, 600	58, 000	.010750	.000750	....	....	
11, 800	59, 000	.011750	.001000	....	....	
12, 000	60, 000	.012850	.001100	....	....	
12, 400	62, 000	.014800	.001950	....	....	
12, 800	64, 000	.016750	.001950	....	....	
13, 200	66, 000	.019050	.002300	....	....	
13, 600	68, 000	.021250	.002200	....	....	
14, 000	70, 000	.023500	.002250	....	....	
14, 400	72, 000	.025750	.002250	....	....	
14, 800	74, 000	.028500	.002750	....	....	
15, 200	76, 000	.031250	.002750	....	....	
15, 600	78, 000	.034850	.003600	....	....	
16, 000	80, 000	.038250	.003400	....	....	
16, 400	82, 000	.043000	.004750	....	....	
16, 800	84, 000	.048100	.005100	....	....	
17, 200	86, 000	.053750	.005650	....	....	
17, 600	88, 000	.062500	.008750	....	....	
18, 000	90, 000	.0675	.0050	....	....	
18, 400	92, 000	.0850	.0175	....	....	
18, 800	94, 000	.1200	.0350	....	....	
18, 810	94, 050	.1450	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	94, 050
Elastic limit per square inch of original section	do....	51, 000
Elongation per inch after rupture	inch..	0. 2450
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46. 2
Position of rupture		1″.00 from neck
Character of broken surface		silky
Elongation of inch sections		″.32*, ″.17

No. 3341.

Marks, $^{82}\frac{R_{41}\ T\ H}{T_1\ M}$
Diameter, ″.504.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001450	.000150	....	....	
9,600	48,000	.001550	.000100	....	....	
9,800	49,000	.001600	.000050	....	....	Elastic limit.
10,000	50,000	.002750	.001150	....	....	
10,200	51,000	.004300	.001650	....	....	
10,400	52,000	.005250	.000950	....	....	
10,600	53,000	.006100	.000850	....	....	
10,800	54,000	.007000	.000900	....	....	
11,000	55,000	.007750	.000750	....	....	
11,200	56,000	.008900	.001150	....	....	
11,400	57,000	.009750	.000850	....	....	
11,600	58,000	.010600	.000850	....	....	
11,800	59,000	.011500	.000900	....	....	
12,000	60,000	.012500	.001000	....	....	
12,400	62,000	.014350	.001850	....	....	
12,800	64,000	.016750	.002400	....	....	
13,200	66,000	.019300	.002550	....	....	
13,600	68,000	.021500	.002200	....	....	
14,000	70,000	.023800	.002300	....	....	
14,400	72,000	.026400	.002600	....	....	
14,800	74,000	.029250	.002850	....	....	
15,200	76,000	.032550	.003300	....	....	
15,600	78,000	.035850	.003300	....	....	
16,000	80,000	.040250	.004400	....	....	
16,400	82,000	.045500	.005250	....	....	
16,800	84,000	.051500	.006000	....	....	
17,200	86,000	.058350	.006850	....	....	
17,600	88,000	.0650	.006650	....	....	
18,000	90,000	.0850	.0200	....	....	
18,390	91,950	.1350	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	91,950
Elastic limit per square inch of original section	do	49,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.15

No. 3342.

Marks, $^{32}\frac{\mathrm{R_0\ T\ H}}{\mathrm{T_2\ M}}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0,	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000450	.000200	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000750	.000150	0.	....	
6, 000	30, 000	.000950	.000200	0.	....	
7, 000	35, 000	.001150	.000200	0.	....	
8, 000	40, 000	.001300	.000150	0.	....	
9, 000	45, 000	.001500	.000200	....	....	
9, 200	46, 000	.001550	.000050	....	....	Elastic limit.
9, 400	47, 000	.001700	.000150	....	....	
9, 600	48, 000	.004200	.002500	....	....	
9, 800	49, 000	.004900	.000700	....	....	
10, 000	50, 000	.005850	.000950	....	....	
10, 200	51, 000	.006900	.001050	....	....	
10, 400	52, 000	.007550	.000650	....	....	
10, 600	53, 000	.008400	.000850	....	....	
10, 800	54, 000	.009150	.000750	....	....	
11, 000	55, 000	.010000	.000850	....	....	
11, 200	56, 000	.010850	.000850	....	....	
11, 400	57, 000	.011850	.001000	....	....	
11, 600	58, 000	.012800	.000950	....	....	
11, 800	59, 000	.013900	.001100	....	....	
12, 000	60, 000	.015000	.001100	....	....	
12, 400	62, 000	.017000	.002000	....	....	
12, 800	64, 000	.019100	.002100	....	....	
13, 200	66, 000	.021250	.002150	....	....	
13, 600	68, 000	.024100	.002850	....	....	
14, 000	70, 000	.026750	.002650	....	....	
14, 400	72, 000	.029800	.003050	....	....	
14, 800	74, 000	.032850	.003050	....	....	
15, 200	76, 000	.036400	.003550	....	....	
15, 600	78, 000	.040850	.004450	....	....	
16, 000	80, 000	.045500	.004650	....	....	
16, 400	82, 000	.051750	.006250	....	....	
16, 800	84, 000	.058100	.006650	....	....	
17, 200	86, 000	.0650	.0066	....	....	
17, 600	88, 000	.0850	.0200	....	....	
18, 000	90, 000	.1100	.0250	....	....	
18, 040	90, 200	.1350	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	90, 200
Elastic limit per square inch of original section............do ...	46, 000
Elongation per inch after rupture............inch..	0. 2250
Elongation per inch under strain at elastic limit............do ...	.001550
Reduction in diameter at point of rupture ....do ...	.125
Reduction in area after rupture, per centum of original section............	43. 3
Position of rupture	1″.10 from neck
Character of broken surface............	silky
Elongation of inch sections	″.28*, .″17

No. 3343.

Marks, $^{32}\overset{R_{4}\,T\,H}{T_{1}\,M}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001100	.000200	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001550	0.	....	....	
9,800	49,000	.001600	.000050	....	....	
10,000	50,000	.001650	.000050	....	....	Elastic limit.
10,200	51,000	.005100	.003450	....	....	
10,400	52,000	.006250	.001150	....	....	
10,600	53,000	.007000	.000750	....	....	
10,800	54,000	.007600	.000600	....	....	
11,000	55,000	.008400	.000800	....	....	
11,200	56,000	.009200	.000800	....	....	
11,400	57,000	.010100	.000900	....	....	
11,600	58,000	.011000	.000900	....	....	
11,800	59,000	.012000	.001000	....	....	
12,000	60,000	.013050	.001050	....	....	
12.400	62,000	.015000	.001950	....	....	
12,800	64,000	.017000	.002000	....	....	
13,200	66,000	.019250	.002250	....	....	
13,600	68,000	.021550	.002300	....	....	
14,000	70,000	.023900	.002350	....	....	
14,400	72,000	.026750	.002850	....	....	
14,800	74,000	.030000	.003250	....	....	
15,200	76,000	.033050	.003050	....	....	
15,600	78,000	.036600	.003550	....	....	
16,000	80,000	.040600	.004000	....	....	
16,400	82,000	.046050	.005450	....	....	
16,800	84,000	.052250	.006200	....	....	
17,200	86,000	.059500	.007250	....	....	
17,600	88,000	.0700	.0105	....	....	
18,000	90,000	.0900	.0200	....	....	
18,290	91,450	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	91,450
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.2200
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		1″.00 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.30*

No. 3344.

Marks, $^{32}\frac{R_a\ T\ H}{T_2\ M}$

Diameter, ".505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000500	.000200	0.	....	
4, 000	20, 000	.000650	.000150	0.	....	
5, 000	25, 000	.000800	.000150	0.	....	
6, 000	30, 000	.001000	.000200	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001300	.000150	0.	....	
9, 000	45, 000	.001500	.000200	....	....	
9, 200	46, 000	.001500	0.	....	....	
9, 400	47, 000	.001550	.000050	....	....	
9, 600	48, 000	.001600	.000050	....	....	
9, 800	49, 000	.001700	000100	....	....	Elastic limit.
10, 000	50, 000	.002750	.001050	....	....	
10, 200	51, 000	.004050	.000300	....	....	
10, 400	52, 000	.005900	.001850	....	....	
10, 600	53, 000	.007000	.001100	....	....	
10, 800	54, 000	.007700	.000700	....	....	
11, 000	55, 000	.008400	.000700	....	....	
11, 200	56, 000	.009050	.000650	....	....	
11, 400	57, 000	.010000	.000950	....	....	
11, 600	58, 000	.010850	.000850	....	....	
11, 800	59, 000	.011900	.001050	....	....	
12, 000	60, 000	.012850	.000950	....	....	
12, 400	62, 000	.014750	.001900	....	....	
12, 800	64, 000	.016750	.001000	....	....	
13, 200	66, 000	.018900	.002150	....	....	
13, 600	68, 000	.021250	.002350	....	....	
14, 000	70, 000	.023750	.002500	....	....	
14, 400	72, 000	.026500	.002750	....	....	
14, 800	74, 000	.029500	.003000	....	....	
15, 200	76, 000	.032550	.003050	....	....	
15, 600	78, 000	.037000	.004450	....	....	
16, 000	80, 000	.041000	.004000	....	....	
16, 400	82, 000	.045500	.004500	....	....	
16, 800	84, 000	.051250	.005750	....	....	
17, 200	86, 000	.058500	.007250	....	....	
17, 600	88, 000	.0650	.0065	....	....	
18, 000	90, 000	.0900	.0250	....	....	
18, 360	91, 800	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	91, 800
Elastic limit per square inch of original section	do	49, 000
Elongation per inch after rupture	inch	0. 2050
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		40. 3
Position of rupture		".85 from neck
Character of broken surface		silky
Elongation of inch sections		".28*, ".13

No. 3345.

Marks, $\substack{^{32}R_{63}\,T\,H \\ T_1\,M}$
Diameter, ''.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001500	.000200	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001650	.000100	....	....	Elastic limit.
9,600	48,000	.003100	.001450	....	....	
9,800	49,000	.004150	.001050	....	....	
10,000	50,000	.005550	.001400	....	....	
10,200	51,000	.006550	.001000	....	....	
10,400	52,000	.007550	.001000	....	....	
10,600	53,000	.008250	.000700	....	....	
10,800	54,000	.009150	.000900	....	....	
11,200	56,000	.011000	.001850	....	....	
11,600	58,000	.013100	.002100	....	....	
12,000	60,000	.015050	.001950	....	....	
12,400	62,000	.017550	.002500	....	....	
12,800	64,000	.020000	.002450	....	....	
13,200	66,000	.022250	.002250	....	....	
13,600	68,000	.025050	.002800	....	....	
14,000	70,000	.028250	.003200	....	....	
14,400	72,000	.031600	.003350	....	....	
14,800	74,000	.035350	.003750	....	....	
15,200	76,000	.039250	.003900	....	....	
15,600	78,000	.044750	.005500	....	....	
16,000	80,000	.051000	.006250	....	....	
16,400	82,000	.058400	.007400	....	....	
16,800	84,000	.0750	.0166	....	....	
17,200	86,000	.0900	.0150	....	....	
17,450	87,250	.1200	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pound	87,250
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.1900
Elongation per inch under strain of elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		40.3
Position of rupture		1''.05 from neck
Character of broken surface		silky
Elongation of inch sections		''.13, ''.25*

No. 3346.

Marks, $^{32}\frac{\text{R. T H}}{\text{T, M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	. 000100	. 000100	— . 000050	— . 000050	
2, 000	10, 000	. 000250	. 000150	— . 000050	0.	
3, 000	15, 000	. 000400	. 000150	— . 000050	0.	
4, 000	20, 000	. 000600	. 000200	— . 000050	0.	
5, 000	25, 000	. 000750	. 000150	— . 000050	0.	
6, 000	30, 000	. 000950	. 000200	— . 000050	0.	
7, 000	35, 000	. 001100	. 000150	— . 000050	0.	
8, 000	40, 000	. 001250	. 000150	— . 000050	0.	
9, 000	45, 000	. 001400	. 000150			
9, 200	46, 000	. 001450	. 000050			
9, 400	47, 000	. 001500	. 000050			
9, 600	48, 000	. 001550	. 000050			Elastic limit.
9, 800	49, 000	. 002050	. 000500			
10, 000	50, 000	. 003950	. 001900			
10, 200	51, 000	. 005200	. 001250			
10, 400	52, 000	. 006250	. 001050			
10, 600	53, 000	. 007250	. 001000			
10, 800	54, 000	. 008100	. 000850			
11, 000	55, 000	. 009050	. 000950			
11, 200	56, 000	. 010000	. 000950			
11, 00	58, 000	. 011550	. 001550			
12, 000	60, 000	. 013900	. 002350			
12, 400	62, 000	. 016050	. 002150			
12, 800	64, 000	. 018100	. 002050			
13, 200	66, 000	. 020350	. 002250			
13, 600	68, 000	. 023050	. 002700			
14, 000	70, 000	. 026000	. 002950			
14, 400	72, 000	. 029000	. 003000			
14, 800	74, 000	. 032750	. 003750			
15, 200	76, 000	. 036550	. 003800			
15, 600	78, 000	. 040950	. 004400			
16, 000	80, 000	. 046000	. 005050			
16, 400	82, 000	. 052250	. 006250			
16, 800	84, 000	. 061250	. 009000			
17, 200	86, 000	. 0700	. 008750			
17, 600	88, 000	. 0900	. 0200			
17, 870	89, 350	. 1400	. 0500			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	89, 350
Elastic limit per square inch of original section	do	48, 000
Elongation per inch after rupture	inch	0. 2350
Elongation per inch under strain at elastic limit	do	. 001550
Reduction in diameter at point of rupture	do	. 135
Reduction in area after rupture, per centum of original section		46. 2
Position of rupture		".90 from neck
Character of broken surface		silky
Elongation of inch sections		".14, ".33

No. 3315.

Marks, $^{32}\,\text{R}_{\bullet}\,\text{T H} \atop \text{T, M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000300	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.009150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001650	.000250	....	....	
10,200	51,000	.001700	.000050	....	....	Elastic limit.
10,400	52,000	.001900	.000200	....	....	
10,600	53,000	.005250	.003350	....	....	
10,800	54,000	.006300	.001050	....	....	
11,000	55,000	.007250	.000950	....	....	
11,200	56,000	.008400	.001150	....	....	
11,400	57,000	.009400	.001000	....	....	
11,600	58,000	.010250	.000850	....	....	
11,800	59,000	.011000	.000750	....	....	
12,000	60,000	.012000	.001000	....	....	
12,400	62,000	.013700	.001700	....	....	
12,800	64,000	.015650	.001950	....	....	
13,200	66,000	.017900	.002250	....	....	
13,600	68,000	.020000	.002100	....	....	
14,000	70,000	.022250	.002250	....	....	
14,400	72,000	.025000	.002750	....	....	
14,800	74,000	.027750	.002750	....	....	
15,200	76,000	.030550	.002800	....	....	
15,600	78,000	.034250	.003700	....	....	
16,000	80,000	.038000	.003750	....	....	
16,400	82,000	.043000	.005000	....	....	
16,800	84,000	.048250	.005250	....	....	
17,200	86,000	.054750	.006500	....	....	
17,600	88,000	.062500	.007750	....	....	
18,000	90,000	.0750	.0125	....	....	
18,400	92,000	.1000	.0250	....	....	
18,620	93,100	.1400	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93,100
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		37.1
Position of rupture		″.65 from neck
Character of broken surface		silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		″.12, ″.28

No. 3316.

Marks, $^{38}\,\frac{B_{46}\ T\ H}{T_{2}\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001200	.000150	0.	....	
9,000	45,000	.001400	.000200	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	Elastic limit.
10,400	52,000	.006000	.004350	....	....	
10,600	53,000	.007000	.001000	....	....	
10,800	54,000	.007750	.000750	....	....	
11,000	55,000	.008500	.000750	....	....	
11,200	56,000	.009350	.000850	....	....	
11,400	57,000	.010250	.000900	....	....	
11,600	58,000	.011250	.001000	....	....	
11,800	59,000	.012050	.000800	....	....	
12,000	60,000	.012900	.000850	....	....	
12,400	62,000	.015000	.002100	....	....	
12,800	64,000	.017000	.002000	....	....	
13,200	66,000	.019250	.002250	....	....	
13,600	68,000	.022000	.002750	....	....	
14,000	70,000	.024500	.002500	....	....	
14,400	72,000	.026900	.002400	....	....	
14,800	74,000	.030000	.003100	....	....	
15,200	76,000	.033000	.003000	....	....	
15,600	78,000	.036500	.003500	....	....	
16,000	80,000	.041000	.004500	....	....	
16,400	82,000	.047500	.006500	....	....	
16,800	84,000	.052500	.005000	....	....	
17,200	86,000	.0600	.0075	....	....	
17,000	88,000	.0650	.0050	....	....	
18,000	90,000	.0850	.0200	....	....	
18,400	92,000	.1200	.0350	....	....	
18,420	92,100	.1850	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	92,100
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2200
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.31*, ″.13

No. 3311.

Marks, $^{32}\mathrm{B}^{8}_{\mathrm{T_1\,M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

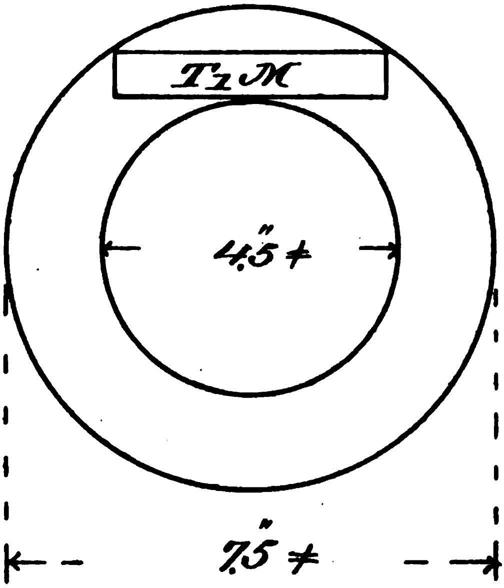
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	Elastic limit.
10,800	54,000	.005000	.003200	....	....	
11,000	55,000	.007500	.002500	....	....	
11,200	56,000	.009000	.001500	....	....	
11,400	57,000	.010300	.001300	....	....	
11,600	58,000	.011150	.000850	....	....	
11,800	59,000	.012000	.000850	....	....	
12,000	60,000	.013000	.001000	....	....	
12,400	62,000	.014900	.001900	....	....	
12,800	64,000	.016550	.001650	....	....	
13,200	66,000	.018750	.002200	....	....	
13,600	68,000	.022000	.003250	....	....	
14,000	70,000	.024550	.002550	....	....	
14,400	72,000	.027750	.003200	....	....	
14,800	74,000	.030600	.002850	....	....	
15,200	76,000	.033750	.003150	....	....	
15,600	78,000	.038250	.004500	....	....	
16,000	80,000	.043500	.005250	....	....	
16,400	82,000	.050250	.006750	....	....	
16,800	84,000	.057000	.006750	....	....	
17,200	86,000	.0650	.0080	....	....	
17,600	88,000	.0850	.0200	....	....	
17,920	89,600	.1200	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	89,600
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.2150
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		1″.05 from neck
Character of broken surface		silky. Opened cracks in surface of stem
Elongation of inch sections		″.31*, ″.13

3.2 inch steel B.L. Rifles

Sleeves



No. 3470.

Marks, ss R S T, M

Diameter, ".505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000350	.000200	0.	....	
3, 000	15, 000	.000450	.000100	0.	....	
4, 000	20, 000	.000650	.000200	0.	....	
5, 000	25, 000	.000850	.000200	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001350	.000200	0.	....	
9, 000	45, 000	.001500	.000150	....	....	
10, 000	50, 000	.001650	.000150	....	....	
10, 200	51. 000	.001750	.000100	....	....	
10, 400	52, 000	.001800	.000050	....	....	
10, 600	53, 000	.001850	.000050	....	....	
10, 800	54, 000	.001900	.000050	....	....	
11, 000	55, 000	.001950	.000050	....	....	Elastic limit.
11, 200	56, 000	.009000	.007050	....	....	
11, 400	57, 000	.009550	.000550	....	....	
11, 600	58, 000	.010500	.000950	....	....	
11, 800	59, 000	.011500	.001000	....	....	
12, 000	60. 000	.012850	.001350	....	....	
12, 400	62, 000	.014500	.001650	....	....	
12, 800	64. 000	.016850	.002350	....	....	
13, 200	66, 000	.020100	.003250	....	....	
13, 600	68, 000	.022350	.002250	....	....	
14, 000	70, 000	.024550	.002200	....	....	
14, 400	72, 000	.027400	.002850	....	....	
14, 800	74, 000	.030850	.003450	....	....	
15, 200	76, 000	.034250	.003400	....	....	
15, 600	78, 000	.038400	.004150	....	....	
16, 000	80, 000	.043750	.005350	....	....	
16, 400	82. 000	.051000	.007250	....	....	
16, 800	84, 000	.058750	.007750	....	....	
17, 200	86, 000	.0700	.011250	....	....	
17, 600	88, 000	.0900	.0200	....	....	
17, 920	89, 600	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89, 600
Elastic limit per square inch of original section	do....	55, 000
Elongation per inch after rupture	inch..	0. 2600
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.16
Reduction in area after rupture, per centum of original section		54. 6
Position of rupture		".80 from neck
Character of broken surface		silky
Elongation of inch sections		".14, ".38

No. 3328.

Marks, $\overset{32\ \mathrm{Rss}\ 8}{T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001500	.000250	....	....	
10,000	50,000	.001650	.000150	....	....	Elastic limit.
10,200	51,000	.001750	.000100	....	....	
10,400	52,000	.004750	.003000	....	....	
10,600	53,000	.006000	.001250	....	....	
10,800	54,000	.007600	.001600	....	....	
11,000	55,000	.008250	.000650	....	....	
11,200	56,000	.009000	.000750	....	....	
11,400	57,000	.010250	.001250	....	....	
11,600	58,000	.011500	.001250	....	....	
11,800	59,000	.012500	.001000	....	....	
12,000	60,000	.018700	.001200	....	....	
12,400	62,000	.015200	.001500	....	....	
12,800	64,000	.017750	.002550	....	....	
13,200	66,000	.020350	.002600	....	....	
13,600	68,000	.022600	.002250	....	....	
14,000	70,000	.025150	.002550	....	....	
14,400	72,000	.028500	.003350	....	....	
14,800	74,000	.031500	.003000	....	....	
15,200	76,000	.035000	.003500	....	....	
15,600	78,000	.039500	.004500	....	....	
16,000	80,000	.045250	.005750	....	....	
16,400	82,000	.052000	.006750	....	....	
16,800	84,000	.059500	.007500	....	....	
17,200	86,000	.0700	.0105	....	....	
17,600	88,000	.0950	.0250	....	....	
17,790	88,950	.1150	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	88,950
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2550
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.166
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		1″.20 from neck
Character of broken surface		fine, silky
Elongation of inch sections		″.19, ″.32*

No. 3434.

Marks, $\overset{32\ \text{Rs}\ 8}{\text{T, M}}$
Diameter ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	Elastic limit.
10,200	51,000	.008100	.006450	....	....	
10,400	52,000	.011500	.003400	....	....	
10,600	53,000	.012300	.000800	....	....	
10,800	54,000	.013250	.000950	....	....	
11,000	55,000	.014800	.001550	....	....	
11,200	56,000	.015850	.001050	....	....	
11,400	57,000	.016900	.001050	....	....	
11,600	58,000	.018000	.001100	....	....	
11,800	59,000	.019100	.001100	....	....	
12,000	60,000	.020250	.001150	....	....	
12,400	62,000	.022400	.002150	....	....	
12,800	64,000	.025050	.002650	....	....	
13,200	66,000	.028000	.002950	....	....	
13,600	68,000	.031100	.003100	....	....	
14,000	70,000	.034800	.003700	....	....	
14,400	72,000	.039000	.004200	....	....	
14,800	74,000	.043750	.004750	....	....	
15,200	76,000	.049500	.005750	....	....	
15,600	78,000	.056750	.007250	....	....	
16,000	80,000	.0625	.005750	....	....	
16,400	82,000	.0750	.0125	....	....	
16,800	84,000	.0950	.0200	....	....	
17,140	85,700	.1450	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85,700
Elastic limit per square inch of original section	do...	50,000
Elongation per inch after rupture	inch..	0.2450
Elongation per inch under strain at elastic limit	do...	.001650
Reduction in diameter at point of rupture	do...	.165
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.37*, ″.12

No. 3383.

Marks, $^{32\ \mathrm{Re}\ \mathrm{S}}_{\mathrm{T_1\ M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
10,000	50,000	.001650	.000150	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	
10,800	54,000	.001850	.000050	....	....	Elastic limit.
11,000	55,000	.002150	.000300	....	....	
11,200	56,000	.002950	.000800	....	....	
11,400	57,000	.005600	.002650	....	....	
11,600	58,000	.006950	.001350	....	....	
11,800	59,000	.007750	.000800	....	....	
12,000	60,000	.008700	.000950	....	....	
12,400	62,000	.010500	.001800	....	....	
12,800	64,000	.012500	.002000	....	....	
13,200	66,000	.014350	.001850	....	....	
13,600	68,000	.016500	.002150	....	....	
14,000	70,000	.018750	.002250	....	....	
14,400	72,000	.021050	.002300	....	....	
14,800	74,000	.023750	.002700	....	....	
15,200	76,000	.026250	.002500	....	....	
15,600	78,000	.029400	.003150	....	....	
16,000	80,000	.033100	.003700	....	....	
16,400	82,000	.036250	.003150	....	....	
16,800	84,000	.041250	.005000	....	....	
17,200	86,000	.046250	.005000	....	....	
17,600	88,000	.052500	.006250	....	....	
18,000	90,000	.061750	.009250	....	....	
18,400	92,000	.0800	.008250	....	....	
18,800	94,000	.1200	.0400	....	....	
18,820	94,100	.1350	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	94,100
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.2450
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		".85 from neck
Character of broken surface		silky
Elongation of inch sections		".35*, ".14

No. 3329.

Marks, $^{82\,\mathrm{Ra}_1\,\mathrm{S}}_{\mathrm{T}_1\,\mathrm{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000750	.000150	0.	....	
6, 000	30, 000	.000950	.000200	0.	....	
7, 000	35, 000	.001150	.000200	0.	....	
8, 000	40, 000	.001300	.000150	0.	....	
9, 000	45, 000	.001450	.000150	....	....	
9, 600	48, 000	.001550	.000100	....	....	
9, 800	49, 000	.001600	.000050	....	....	
10, 000	50, 000	.001650	.000050	....	....	Elastic limit.
10, 200	51, 000	.002500	.000850	....	....	
10, 400	52, 000	.008100	.005600	....	....	
10, 600	53, 000	.008650	.000550	....	....	
10, 800	54, 000	.009450	.000800	....	....	
11, 000	55, 000	.010250	.000800	....	....	
11, 200	56, 000	.011550	.001300	....	....	
11, 400	57, 000	.013050	.001500	....	....	
11, 600	58, 000	.014000	.000950	....	....	
11, 800	59, 000	.014800	.000800	....	....	
12, 000	60, 000	.015650	.000850	....	....	
12, 400	62, 000	.018400	.002750	....	....	
12, 800	64, 000	.021050	.002650	....	....	
13, 200	66, 000	.023750	.002700	....	....	
13, 600	68, 000	.026650	.002900	....	....	
14, 000	70, 000	.029850	.003200	....	....	
14, 400	72, 000	.033750	.003900	....	....	
14, 800	74, 000	.037600	.003850	....	....	
15, 200	76, 000	.041900	.004300	....	....	
15, 600	78, 000	.048500	.006600	....	....	
16, 000	80, 000	.056750	.008250	....	....	
16, 400	82, 000	.065500	.008750	....	....	
16, 800	84, 000	.0900	.0245	....	....	
17, 150	85, 750	.1250	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85, 750
Elastic limit per square inch of original section	do....	50, 000
Elongation per inch after rupture	inch..	0. 1550
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.065
Reduction in area after rupture, per centum of original section		28. 9
Position of rupture		″:65 from neck
Character of broken surface		silky, flaky. Opened cracks in surface of stem
Elongation of inch sections		″.10, ″.21

No. 3382.

Marks, $\genfrac{}{}{0pt}{}{82\,R_{II}\,S}{T_3\,M}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.900250	.000100	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001600	.000150	....	....	
10,200	51,000	.001650	.000050	....	....	Elastic limit.
10,400	52,000	.005850	.004200	....	....	
10,600	53,000	.007500	.001650	....	....	
10,800	54,000	.008500	.001000	....	....	
11,000	55,000	.009500	.001000	....	....	
11,200	56,000	.010350	.000850	....	....	
11,400	57,000	.011600	.001250	....	....	
11,600	58,000	.012500	.000900	....	....	
11,800	59,000	.013650	.001150	....	....	
12,000	60,000	.014750	.001100	....	....	
12,400	62,000	.017150	.002400	....	....	
12,800	64,000	.019850	.002700	....	....	
13,200	66,000	.022400	.002550	....	....	
13,600	68,000	.025100	.002700	....	....	
14,000	70,000	.028400	.003300	....	....	
14,400	72,000	.032000	.003600	....	....	
14,800	74,000	.036350	.004350	....	....	
15,200	76,000	.040950	.004600	....	....	
15,600	78,000	.047500	.006550	....	....	
16,000	80,000	.054000	.006500	....	....	
16,400	82,000	.063750	.009750	....	....	
16,800	84,000	.0850	.011250	....	....	
17,200	86,000	.1100	.0250	....	....	
17,240	86,200	.1350	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	86,200
Elastic limit per square inch of original section	do	51,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.90 from neck
Character of broken surface		silky. Opened cracks in surface of stem
Elongation of inch sections		″.13, ″.35*

No. 3330.

Marks, $\overset{82\ \mathrm{Ra}\ 8}{\mathrm{T_1\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001600	.000150	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	Elastic limit.
10,600	53,000	.003200	.001600	....	....	
10,800	54,000	.004250	.001050	....	....	
11,000	55,000	.007700	.002450	....	....	
11,200	56,000	.009250	.001550	....	....	
11,400	57,000	.010000	.000750	....	....	
11,600	58,000	.011000	.001000	....	....	
11,800	59,000	.011900	.000900	....	....	
12,000	60,000	.012750	.000850	....	....	
12,400	62,000	.015500	.002750	....	....	
12,800	64.000	.017750	.002250	....	....	
13,200	66,000	.020000	.002250	....	....	
13,600	68,000	.022250	.002250	....	....	
14,000	70,000	.025350	.003100	....	....	
14,400	72,000	.028250	.002900	....	....	
14,800	74,000	.032000	.003750	....	....	
15,200	76,000	.035350	.003350	....	....	
15,600	78,000	.040250	.004900	....	....	
16,000	80,000	.047000	.006750	....	....	
16,400	82,000	.053750	.006750	....	....	
16,800	84,000	.061250	.007500	....	....	
17,200	86,000	.0800	.008750	....	....	
17,600	88,000	.1050	.0250	....	....	
17,720	88,600	.1500	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	88,600
Elastic limit per square inch of original section	do ...	52,000
Elongation per inch after rupture	inch..	0.2050
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		87.1
Position of rupture		″.80 from neck
Character of broken surface		silky, lamellar. Opened cracks in surface of stem
Elongation of inch sections		″.30*, ″.11

No. 3435.

Marks, $^{82\ \mathrm{Rss}\ \mathrm{S}}_{\mathrm{T_1\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001700	0.	....	....	
10,400	52,000	.001750	.000050	....	....	Elastic limit.
10,600	53,000	.002000	.000250	....	....	
10,800	54,000	.003400	.001400	....	....	
11,000	55,000	.004000	.000600	....	....	
11,200	56,000	.004750	.000750	....	....	
11,400	57,000	.006500	.001750	....	....	
11,600	58,000	.007500	.001000	....	....	
11,800	59,000	.008500	.001000	....	....	
12,000	60,000	.009500	.001000	....	....	
12,400	62,000	.011350	.001850	....	....	
12,800	64,000	.013100	.001750	....	....	
13,200	66,000	.015150	.002050	....	....	
13,600	68,000	.017250	.002100	....	....	
14,000	70,000	.019300	.002050	....	....	
14,400	72,000	.021800	.002500	....	....	
14,800	74,000	.024250	.002450	....	....	
15,200	76,000	.027050	.002800	....	....	
15,600	78,000	.029600	.002550	....	....	
16,000	80,000	.033100	.003500	....	....	
16,400	82,000	.036900	.003800	....	....	
16,800	84,000	.041150	.004250	....	....	
17,200	86,000	.046750	.005600	....	....	
17,600	88,000	.053100	.006350	....	....	
18,000	90,000	.0600	.0069	....	....	
18,400	92,000	.0750	.0150	....	....	
18,800	94,000	.1050	.0300	....	....	
18,870	94,350	.1350	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	94,350
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		″.75 from neck
Character of broken surface, granular, 60 per cent.; silky, 40 per cent. Opened cracks in surface of stem.		
Elongation of inch sections		″.27*, ″.12

No. 3436.

Marks, $\overset{82\ \mathrm{R}_4\ 8}{\mathrm{T}_1\ \mathrm{M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	....	....	
2,000	10,000	.000250	.000150	....	....	
3,000	15,000	.000450	.000200	....	....	
4,000	20,000	.000650	.000200	....	....	
5,000	25,000	.000800	.000150	....	....	
6,000	30,000	.001000	.000200	....	....	
7,000	35,000	.001200	.000200	....	....	
8,000	40,000	.001350	.000150	....	....	
9,000	45,000	.001500	.000150	....	....	
10,000	50,000	.001650	.000150	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	
10,800	54,000	.001850	.000050	....	....	Elastic limit.
11,000	55,000	.001950	.000100	....	....	
11,200	56,000	.003450	.001500	....	....	
11,400	57,000	.005050	.001600	....	....	
11,600	58,000	.006050	.001060	....	....	
11,800	59,000	.007050	.001000	....	....	
12,000	60,000	.008250	.001200	....	....	
12,400	62,000	.009600	.001350	....	....	
12,800	64,000	.011350	.001700	....	....	
13,200	66,000	.013200	.001850	....	....	
13,600	68,000	.015050	.001850	....	....	
14,000	70,000	.016900	.001850	....	....	
14,400	72,000	.019000	.002100	....	....	
14,800	74,000	.021100	.002100	....	....	
15,200	76,000	.023350	.002250	....	....	
15,600	78,000	.025600	.002250	....	....	
16,000	80,000	.028000	.002400	....	....	
16,400	82,000	.031100	.003100	....	....	
16,800	84,000	.034250	.003150	....	....	
17,200	86,000	.038100	.003850	....	....	
17,600	88,000	.042000	.003900	....	....	
18,000	90,000	.047250	.005250	....	....	
18,400	92,000	.054600	.007350	....	....	
18,800	94,000	.0575	.0029	....	....	
19,200	96,000	.0700	.0125	....	....	
19,600	98,000	.0950	.0250	....	....	
19,710	98,550	.1350	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	98,550
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.2250
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.8
Position of rupture		1".10 from neck
Character of broken surface		silky
Elongation of inch sections		".17, ".26*

No. 3384.

Marks, $\overset{82\ \mathrm{R_{ss}}\ \mathrm{S}}{\mathrm{T_1\ M}}$
Diameter, ″.506.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000300	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	.000050	.000050	
9,000	45,000	.001550	.000200	....	....	
10,000	50,000	.001750	.000200	....	....	
10,200	51,000	.001800	.000050	....	....	
10,400	52,000	.001850	.000050	....	....	
10,600	53,000	.001900	.000050	....	....	
10,800	54,000	.001950	.000050	....	....	
11,000	55,000	.002050	.000100	....	....	Elastic limit.
11,200	56,000	.002200	.000150	....	....	
11,400	57,000	.002550	.000350	....	....	
11,600	58,000	.003400	.000850	....	....	
11,800	59,000	.004750	.001350	....	....	
12,000	60,000	.006000	.001250	....	....	
12,400	62,000	.009000	.003000	....	....	
12,800	64,000	.011100	.002100	....	....	
13,200	66,000	.013100	.002000	....	....	
13,600	68,000	.015500	.002400	....	....	
14,000	70,000	.017500	.002000	....	....	
14,400	72,000	.019750	.002250	....	....	
14,800	74,000	.022250	.002500	....	....	
15,200	76,000	.025100	.002850	....	....	
15,600	78,000	.028250	.003150	....	....	
16,000	80,000	.031250	.003000	....	....	
16,400	82,000	.035250	.004000	....	....	
16,800	84,000	.039750	.004500	....	....	
17,200	86,000	.044850	.005100	....	....	
17,600	88,000	.051000	.006150	....	....	
18,000	90,000	,059150	.008150	....	....	
18,400	92,000	.0700	.010850	....	....	
18,800	94,000	.0950	.0250	....	....	
18,870	94,350	.1250	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	94,350
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.2450
Elongation per inch under strain at elastic limit	do	.002050
Reduction in diameter at point of rupture	do	.156
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.37

No. 3331.

Marks, $\overset{32\ R_{s}\ S}{T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001700	0.	....	....	
10,600	53,000	.001750	.000050	....	....	Elastic limit.
10,800	54,000	.002050	.000300	....	....	
11,000	55,000	.005500	.003450	....	....	
11,200	56,000	.008100	.002600	....	....	
11,400	57,000	.009250	.001150	....	....	
11,600	58,000	.010350	.001100	....	....	
11,800	59,000	.011400	.001050	....	....	
12,000	60,000	.012500	.001100	....	....	
12,400	62,000	.014500	.002000	....	....	
12,800	64,000	.016000	.001500	....	....	
13,200	66,000	.018100	.002100	....	....	
13,600	68,000	.020400	.002300	....	....	
14,000	70,000	.022800	.002400	....	....	
14,400	72,000	.025800	.003000	....	....	
14,800	74,000	.028750	.002950	....	....	
15,200	76,000	.032000	.003250	....	....	
15,600	78,000	.035550	.003550	....	....	
16,000	80,000	.039750	.004200	....	....	
16,400	82,000	.044750	.005000	....	....	
16,800	84,000	.051500	.006750	....	....	
17,200	86,000	.059000	.007500	....	....	
17,600	88,000	.0650	.0060	....	....	
18,000	90,000	.0850	.0200	....	....	
18,300	91,500	.1400	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91,500
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.2500
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		″.62 from neck
Character of broken surface		fine, silky
Elongation of inch sections		″.37*, ″.13

No. 3312.

Marks, $\overset{32\ \mathrm{Bar}\ S}{T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	.0	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000350	.000200	0.		
3,000	15,000	.000550	.000200	0.		
4,000	20,000	.000700	.000150	0.		
5,000	25,000	.000900	.000200	0.		
6,000	30,000	.001050	.000150	0.		
7,000	35,000	.001200	.000150	0.		
8,000	40,000	.001350	.000150	0.		
9,000	45,000	.001500	.000150			
10,000	50,000	.001700	.000200			
10,200	51,000	.001750	.000050			
10,400	52,000	.001800	.000050			
10,600	53,000	.001850	.000050			Elastic limit.
10,800	54,000	.003500	.001650			
11,000	55,000	.005250	.001750			
11,200	56,000	.006500	.001250			
11,400	57,000	.007400	.000900			
11,600	58,000	.008500	.001100			
11,800	59,000	.009400	.000900			
12,000	60,000	.010300	.000900			
12,400	62,000	.011600	.001300			
12,800	64,000	.013750	.002150			
13,200	66,000	.015750	.002000			
13,600	68,000	.017550	.001800			
14,000	70,000	.019900	.002350			
14,400	72,000	.022350	.002450			
14,800	74,000	.024500	.002150			
15,200	76,000	.027000	.002500			
15,600	78,000	.030000	.003000			
16,000	80,000	.033250	.003250			
16,400	82,000	.037000	.003750			
16,800	84,000	.043800	.006800			
17,200	86,000	.046250	.002450			
17,600	88,000	.053000	.006750			
18,000	90,000	.0600	.0070			
18,400	92,000	.0650	.0050			
18,800	94,000	.0900	.0250			
19,010	95,050	.1300	.0400			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	95,050
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.2500
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.15, ″.35

No. 3437.

Marks, $^{82\ R_a\ S}_{\ \ T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000750	.000150	0.	....	
6, 000	30, 000	.000950	.000200	0.	....	
7, 000	35, 000	.001100	.000150	0.	....	
8, 000	40, 000	.001250	.000150	0.	....	
9, 000	45, 000	.001450	.000200	....	....	
10, 000	50, 000	.001650	.000200	....	....	
10, 200	51, 000	.001700	.000050	....	....	Elastic limit.
10, 400	52, 000	.002000	.000300	....	....	
10, 600	53, 000	.002500	.000500	....	....	
10, 800	54, 000	.003700	.001200	....	....	
11, 000	55, 000	.005600	.001900	....	....	
11, 200	56, 000	.007400	.001800	....	....	
11, 400	57, 000	.008600	.001200	....	....	
11, 600	58, 000	.009600	.001000	....	....	
11, 800	59, 000	.010600	.001000	....	....	
12, 000	60, 000	.011650	.001050	....	....	
12, 400	62, 000	.013750	.002100	....	....	
12, 800	64, 000	.016050	.002300	....	....	
13, 200	66, 000	.018400	.002350	....	....	
13, 600	68, 000	.020550	.002150	....	....	
14, 000	70, 000	.023400	.002850	....	....	
14, 400	72, 000	.026350	.002950	....	....	
14, 800	74, 000	.029400	.003050	....	....	
15, 200	76, 000	.032550	.003150	....	....	
15, 600	78, 000	.036550	.004000	....	....	
16, 000	80, 000	.041050	.004500	....	....	
16, 400	82, 000	.047000	.005950	....	....	
16, 800	84, 000	.054500	.007500	....	....	
17, 200	86, 000	.0575	.0030	....	....	
17, 600	88, 000	.0800	.0225	....	....	
18, 000	90, 000	.1050	.0250	....	....	
18, 040	90, 200	.1350	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90, 200
Elastic limit per square inch of original section	do....	51, 000
Elongation per inch after rupture	inch..	0. 2700
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		54. 6
Position of rupture		1″.10 from neck
Character of broken surface		silky
Elongation of inch sections		″.35*, ″.19

No. 3252.

Marks, $^{82\,R\,S}_{T,\,M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001200	.000150	0.	....	
9,000	45,000	.001350	.000150	....	....	
10,000	50,000	.001500	.000150	....	....	
10,200	51,000	.001550	.000050	....	....	
10,400	52,000	.001600	.000050	....	....	
10,600	53,000	.001650	.000050	....	....	
10,800	54,000	.001700	.000050	....	....	
11,000	55,000	.001750	.000050	....	....	Elastic limit.
11,200	56,000	.001900	.000150	....	....	
11,400	57,000	.002300	.000400	....	....	
11,600	58,000	.003600	.001300	....	....	
11,800	59,000	.005000	.001400	....	....	
12,000	60,000	.007750	.002750	....	....	
12,400	62,000	.009500	.001750	....	....	
12,800	64,000	.011600	.002100	....	....	
13,200	66,000	.013500	.001900	....	....	
13,600	68,000	.015850	.002350	....	....	
14,000	70,000	.018100	.002250	....	....	
14,400	72,000	.020600	.002500	....	....	
14,800	74,000	.023100	.002500	....	....	
15,200	76,000	.025850	.002750	....	....	
15,600	78,000	.029250	.003400	....	....	
16,000	80,000	.032500	.003250	....	....	
16,400	82,000	.036100	.093600	....	....	
16,800	84,000	.040800	.004700	....	....	
17,200	86,000	.046000	.005200	....	....	
17,600	88,000	.0525	.0065	....	....	
18,000	90,000	.0600	.0075	....	....	
18,400	92,000	.0700	.0100	....	....	
18,800	94,000	.1050	.0350	....	....	
18,810	94,050	.1300	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	94,050
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.2550
Elongation per inch under strain at elastic limit	do	.001750
Reduction in diameter at point of rupture	do	.165
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		".85 from neck
Character of broken surface		silky
Elongation of inch sections		".15, ".36*

No. 3253.

Marks, $\overset{32\,R_3\,S}{T_1\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001250	.000100	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	Elastic limit.
10,600	53,000	.002800	.001100	....	....	
10,800	54,000	.004250	.001450	....	....	
11,000	55,000	.005400	.001150	....	....	
11,200	56,000	.006700	.001300	....	....	
11,400	57,000	.007600	.000900	....	....	
11,600	58,000	.008600	.001000	....	....	
11,800	59,000	.009550	.000950	....	....	
12,000	60,000	.010500	.000950	....	....	
12,400	62,000	.012550	.002050	....	....	
12,800	64,000	.014600	.002050	....	....	
13,200	66,000	.016550	.001950	....	....	
13,600	68,000	.019000	.002450	....	....	
14,000	70,000	.021250	.002250	....	....	
14,400	72,000	.023800	.002550	....	....	
14,800	74,000	.026600	.002800	....	....	
15,200	76,000	.029600	.003000	....	....	
15,600	78,000	.033150	.003550	....	....	
16,000	80,000	.037000	.003850	....	....	
16,400	82,000	.041750	.004750	....	....	
16,800	84,000	.047500	.005750	....	....	
17,200	86,000	.053750	.006250	....	....	
17,600	88,000	.0600	.006250	....	....	
18,000	90,000	.0800	.0200	....	....	
18,360	91,800	.1200	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91,800
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2300
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.31*, ″.15

No. 3254.

Marks, $\overset{32\ R_4\ 8}{T,\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000800	.000200	0.	....	
6, 000	30, 000	.001000	.000200	0.	....	
7, 000	35, 000	.001150	.000150	0.	....	
8, 000	40, 000	.001300	.000150	0.	....	
9, 000	45, 000	.001450	.000150	....	....	
10, 000	50, 000	.001650	.000200	....	....	
10, 200	51, 000	.001700	.000050	....	....	
10, 400	52, 000	.001800	.000100	....	....	Elastic limit.
10, 600	53, 000	.003500	.001700	....	....	
10, 800	54, 000	.007000	.003500	....	....	
11, 000	55, 000	.007850	.000850	....	....	
11, 200	56, 000	.008900	.001050	....	....	
11, 400	57, 000	.010000	.001100	....	....	
11, 600	58, 000	.011050	.001050	....	....	
11, 800	59, 000	.012100	.001050	....	....	
12, 000	60, 000	.013400	.001300	....	....	
12, 400	62, 000	.015500	.002100	....	....	
12, 800	64, 000	.018150	.002650	....	....	
13, 200	66, 000	.020550	.002400	....	....	
13, 600	68, 000	.023500	.002950	....	....	
14, 000	70, 000	.026500	.003000	....	....	
14, 400	72, 000	.029900	.003400	....	....	
14, 800	74, 000	.033700	.003800	....	....	
15, 200	76, 000	.037750	.004050	....	....	
15, 600	78, 000	.043000	.005250	....	....	
16, 000	80, 000	.050000	.007000	....	....	
16, 400	82, 000	.0550	.0050	....	....	
16, 800	84, 000	.0625	.0075	....	....	
17, 200	86, 000	.0900	.0275	....	....	
17, 390	86, 950	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.........pounds..	86, 950
Elastic limit per square inch of original section.........do....	52, 000
Elongation per inch after rupture.........inch..	0. 2550
Elongation per inch under strain at elastic limit.........do....	.001800
Reduction in diameter at point of rupture.........do....	.165
Reduction in area after rupture, per centum of original section.........	54. 6
Position of rupture.........	1″.15 from neck
Character of broken surface.........	silky
Elongation of inch sections.........	″.30*, ″.21

No. 3255.

Marks, $^{\text{32 Ra S}}_{\text{T}_1\text{ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000400	.000150	0.	....	
4, 000	20, 000	.000550	.000150	0.	....	
5, 000	25, 000	.000700	.500150	0.	....	
6, 000	30, 000	.000850	.000150	0.	....	
7, 000	35, 000	.001050	.000200	0.	....	
8, 000	40, 000	.001200	.000150	0.	....	
9, 000	45, 000	.001400	.000200	....	....	
9, 200	46, 000	.001450	.000050	....	....	
9, 400	47, 000	.001500	.000050	....	....	
9, 600	48, 000	.001550	.000050	....	....	
9, 800	49, 000	.001650	.000100	....	....	Elastic limit.
10, 000	50, 000	.002500	.000850	....	....	
10, 200	51, 000	.004100	.001600	....	....	
10, 400	52, 000	.006900	.002800	....	....	
10, 600	53, 000	.007750	.000850	....	....	
10, 800	54, 000	.008600	.000850	....	....	
11, 000	55, 000	.009500	.000900	....	....	
11, 200	56, 000	.010250	.000750	....	....	
11, 400	57, 000	.011250	.001000	....	....	
11, 600	58, 000	.012000	.000750	....	....	
11, 800	59, 000	.012750	.000750	....	....	
12, 000	60, 000	.013750	.001000	....	....	
12, 400	62, 000	.016000	.002250	....	....	
12, 800	64, 000	.018500	.002500	....	....	
13, 200	66, 000	.020500	.002000	....	....	
13, 600	68, 000	.023000	.002500	....	....	
14, 000	70, 000	.026000	.003000	....	....	
14, 400	72, 000	.028750	.002750	....	....	
14, 800	74, 000	.032000	.003250	....	....	
15, 200	76, 000	.035750	.003750	....	....	
15, 600	78, 000	.040000	.004250	....	....	
16, 000	80, 000	.045000	.005000	....	....	
16, 400	82, 000	.051250	.006250	....	....	
16, 800	84, 000	.0575	.006250	....	....	
17, 200	86, 000	.0675	.0100	....	....	
17, 600	88, 000	.0900	.0225	....	....	
17, 960	89, 800	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89, 800
Elastic limit per square inch of original section	do....	49, 000
Elongation per inch after rupture	inch..	0. 2500
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51. 9
Position of rupture		1″.15 from neck
Character of broken surface		silky
Elongation of inch sections		″.31*. ″.19

No. 3256.

Marks, $^{32\,\mathrm{R}\,\mathrm{S}}_{\mathrm{T}_1\,\mathrm{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001600	.000150	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	
10,600	53,000	.001800	.000100	....	....	Elastic limit.
10,800	54,000	.005050	.003250	....	....	
11,000	55,000	.006200	.001150	....	....	
11,200	56,000	.007250	.001050	....	....	
11,400	57,000	.008250	.001000	....	....	
11,600	58,000	.009250	.001000	....	....	
11,800	59,000	.010150	.000900	....	....	
12,000	60,000	.011350	.001200	....	....	
12,400	62,000	.013250	.001900	....	....	
12,800	64,000	.015000	.001750	....	....	
13,200	66,000	.017000	.002000	....	....	
13,600	68,000	.019000	.002000	....	....	
14,000	70,000	.021100	.002100	....	....	
14,400	72,000	.023500	.002400	....	....	
14,800	74,000	.026250	.002750	....	....	
15,200	76,000	.029550	.003300	....	....	
15,600	78,000	.032500	.002950	....	....	
16,000	80,000	.036250	.003750	....	....	
16,400	82,000	.040750	.004500	....	....	
16,800	84,000	.045250	.004500	....	....	
17,200	86,000	.051000	.005750	....	....	
17,600	88,000	.0575	.0065	....	....	
18,000	90,000	.0650	.0075	....	....	
18,400	92,000	.0950	.0300	....	....	
18,510	92,550	.1250	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	92,550
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0 2400
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		″.95 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.36*

No. 3332.

Marks, $^{82\,R_{44}\,S}_{T_1\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001350	.000200	.000050	.000050	
9,000	45,000	.001550	.000200	....	....	
10,000	50,000	.001700	.000150	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	
10,600	53,000	.001850	.000050	....	....	
10,800	54,000	.001900	.000050	....	....	Elastic limit.
11,000	55,000	.002300	.000400	....	....	
11,200	56,000	.003050	.000750	....	....	
11,400	57,000	.003750	.000700	....	....	
11,600	58,000	.005250	.001500	....	....	
11,800	59,000	.007450	.002200	....	....	
12,000	60,000	.009250	.001800	....	....	
12,400	62,000	.011500	.002250	....	....	
12,800	64,000	.013600	.002100	....	....	
13,200	66,000	.015850	.002250	....	....	
13,600	68,000	.018350	.002500	....	....	
14,000	70,000	.020850	.002500	....	....	
14,400	72,000	.023600	.002750	....	....	
14,800	74,000	.026650	.003050	....	....	
15,200	76,000	.030050	.003400	....	....	
15,600	78,000	.034250	.004200	....	....	
16,000	80,000	.038750	.004500	....	....	
16,400	82,000	.044000	.005250	....	....	
16,800	84,000	.051000	.007000	....	....	
17,200	86,000	.0590	.0080	....	....	
17,800	88,000	.0750	.0160	....	....	
18,000	90,000	.1000	.0250	....	....	
18,060	90,300	.1300	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90,300
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.2500
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.065
Reduction in area after rupture, per centum of original section		23.9
Position of rupture		″.80 from neck
Character of broken surface		fine, silky
Elongation of inch sections		″.12, ″.38

No. 3353.

Marks, $\overset{32\,R_{48}\,S}{T_1\,M}$
Diameter, ''.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000700	.000150	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001750	0.	....	....	Elastic limit.
10,800	54,000	.001850	.000100	....	....	
11,000	55,000	.004250	.002400	....	....	
11,200	56,000	.010000	.005750	....	....	
11,400	57,000	.011000	.001000	....	....	
11,600	58,000	.011400	.000400	....	....	
11,800	59,000	.012200	.000800	....	....	
12,000	60,000	.013600	.001400	....	....	
12,400	62,000	.015550	.001950	....	....	
12,800	64,000	.018050	.002500	....	....	
13,200	66,000	.020800	.002750	....	....	
13,600	68,000	.023750	.002950	....	....	
14,000	70,000	.026250	.002500	....	....	
14,400	72,000	.029500	.003250	....	....	
14,800	74,000	.032600	.003100	....	....	
15,200	76,000	.036550	.003950	....	....	
15,600	78,000	.041250	.004700	....	....	
16,000	80,000	.047000	.005750	....	....	
16,400	82,000	.054250	.007250	....	....	
16,800	84,000	.064300	.010050	....	....	
17,200	86,000	.0800	.0157	....	....	
17,600	88,000	.1000	.0200	....	....	
17,780	88,900	.1400	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	88,900
Elastic limit per square inch of original section	do ...	53,000
Elongation per inch after rupture	inch ..	0.2550
Elongation per inch under strain at elastic limit	do	.001750
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		''.80 from neck
Character of broken surface		silky
Elongation of inch sections		''.13, ''.33*

No. 3471.

Marks, $^{32\,Bs\,S}_{T_1\,M}$
Diameter ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000250	.000100	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000900	.000100	0.	....	
7,000	35,000	.001100	.000200	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001600	.000150	....	....	Elastic limit.
10,200	51,000	.003000	.001400	....	....	
10,400	52,000	.004350	.001350	....	....	
10,600	53,000	.007400	.001050	....	....	
10,800	54,000	.008100	.000700	....	....	
11,000	55,000	.009100	.001000	....	....	
11,200	56,000	.010600	.001500	....	....	
11,400	57,000	.011900	.001300	....	....	
11,600	58,000	.013100	.001200	....	....	
11,800	59,000	.014350	.001250	....	....	
12,000	60,000	.015550	.001200	....	....	
12,400	62,000	.017500	.001950	....	....	
12,800	64,000	.020000	.002500	....	....	
13,200	66,000	.023750	.003750	....	....	
13,600	68,000	.026500	.002750	....	....	
14,000	70,000	.029750	.003250	....	....	
14,400	72,000	.032500	.002750	....	....	
14,800	74,000	.037000	.004500	....	....	
15,200	76,000	.041300	.004300	....	....	
15,600	78,000	.046750	.005450	....	....	
16,000	80,000	.054000	.007250	....	....	
16,400	82,000	.0650	.0110	....	....	
16,800	84,000	.0850	.0200	....	....	
17,200	86,000	.1300	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	86,000
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2650
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.175
Reduction in area after rupture, per centum of original section		57.2
Position of rupture		".75 from neck
Character of broken surface		silky
Elongation of inch sections		".39*, ".14

No. 3438.

Marks, $\overset{32\ R_G\ 8}{T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000200	.000100	0.	....	
3,000	15,000	.000400	.000200	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001100	.000200	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001800	.000050	....	....	Elastic limit.
10,800	54,000	.004000	.002200	....	....	
11,000	55,000	.007900	.003900	....	....	
11,200	56,000	.008750	.000850	....	....	
11,400	57.000	.009750	.001000	....	....	
11,600	58,000	.010600	.000850	....	....	
11,800	59,000	.011650	.001050	....	....	
12,000	60,000	.012600	.000950	....	....	
12,400	62,000	.014750	.002150	....	....	
12,800	64,000	.016900	.002150	....	....	
13,200	66,000	.019900	.003000	....	....	
13,600	68,000	022000	.002100	....	....	
14,000	70,000	.024500	.002500	....	....	
14,400	72,000	.027350	.002850	....	....	
14,800	74,000	.030350	.003000	....	....	
15,200	76,000	.033600	.003250	....	....	
15,600	.78,000	.037400	.003800	....	....	
16,000	80,000	.042300	.004900	....	....	
16,400	82,000	.047750	.005450	....	....	
16,800	84,000	.054750	.007000	....	....	
17,200	86,000	.0600	.005250	....	....	
17,600	88,000	.0750	.0150	....	....	
18,000	90,000	.1050	.0300	....	....	
18,120	90,600	.1350	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	90,600
Elastic limit per square inch of original section	do ...	53,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		″.95 from neck
Character of broken surface		silky
Elongation of inch sections		″.13, ″.35*

No. 3385.

Marks, $\genfrac{}{}{0pt}{}{32\text{ R, }48\text{ S}}{\text{T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	....	....	
9,200	46,000	.001600	.000100	....	....	Elastic limit.
9,400	47,000	.002250	.000650	....	....	
9,600	48,000	.011650	.009400	....	....	
9,800	49,000	.012300	.000650	....	....	
10,000	50,000	.013100	.000800	....	....	
10,200	51,000	.014250	.001150	....	....	
10,400	52,000	.015250	.001000	....	....	
10,600	53,000	.016150	.000900	....	....	
10,800	54,000	.017100	.000950	....	....	
11,000	55,000	.018100	.001000	....	....	
11,200	56,000	.019330	.001250	....	....	
11,400	57,000	.020550	.001200	....	....	
11,600	58,000	.021550	.001000	....	....	
11,800	59,000	.022750	.001200	....	....	
12,000	60,000	.024050	.001300	....	....	
12,400	62,000	.027000	.002950	....	....	
12,800	64,000	.030100	.003100	....	....	
13,200	66,000	.033650	.003550	....	....	
13,600	68,000	.037250	.003600	....	....	
14,000	70,000	.042000	.004750	....	....	
14,400	72,000	.047000	.005000	....	....	
14,800	74,000	.052750	.005750	....	....	
15,200	76,000	.0575	.004750	....	....	
15,600	78,000	.0650	.0075	....	....	
16,000	80,000	.0850	.0200	....	....	
16,400	82,000	.1050	.0200	....	....	
16,720	83,600	.1550	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	83,600
Elastic limit per square inch of original section	do	46,000
Elongation per inch after rupture	inch	0.2500
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.45 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.36*

No. 3439.

Marks, $^{32\ \mathrm{R_e S}}_{\mathrm{T_1\ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000700	.000150	0.	....	
5,000	25,000	.000900	.000200	0.	....	
6,000	30,000	.001050	.000150	0.	....	
7,000	35,000	.001250	.000200	0.	....	
8,000	40,000	.001400	.000150	0.	....	
9,000	45,000	.001550	.000150	....	....	
10,000	50,000	.001700	.000150	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	Elastic limit.
10,600	53,000	.005050	.003250	....	....	
10,800	54,000	.007500	.002450	....	....	
11,000	55,000	.008500	.001000	....	....	
11,200	56,000	.009500	.001000	....	....	
11,400	57,000	.010500	.001000	....	....	
11,600	58,000	.011500	.001000	....	....	
11,800	59,000	.012650	.001150	....	....	
12,000	60,000	.013750	.001100	....	....	
12,400	62,000	.016400	.002650	....	....	
12,800	64,000	.019000	.002600	....	....	
13,200	66,000	.021750	.002750	....	....	
13,600	68,000	.024500	.002750	....	....	
14,000	70,000	.027600	.003100	....	....	
14,400	72,000	.031000	.003400	....	....	
14,800	74,000	.034050	.003050	....	....	
15,200	76,000	.037850	.003800	....	....	
15,600	78,000	.043500	.005650	....	....	
16,000	80,000	.049900	.006400	....	....	
16,400	82,000	.058000	.008100	....	....	
16,800	84,000	.0625	.0045	....	....	
17,200	86,000	.0850	.0225	....	....	
17,400	87,000	.1150	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	87,000
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		1″.10 from neck
Character of broken surface		silky
Elongation of inch sections		″.32*, ″.16

No. 3440.

Marks, $\genfrac{}{}{0pt}{}{32\ R_{20}\ S}{T_1\ M}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.		
2,000	10,000	.000250	.000150	0.		
3,000	15,000	.000400	.000150	0.		
4,000	20,000	.000550	.000150	0.		
5,000	25,000	.000750	.000200	0.		
6,000	30,000	.000950	.000200	0.		
7,000	35,000	.001100	.000150	0.		
8,000	40,000	.001300	.000200	0.		
9,000	45,000	.001450	.000150			
10,000	50,000	.001650	.000200			
10,200	51,000	.001700	.000050			Elastic limit.
10,400	52,000	.001850	.000150			
10,600	53,000	.003500	.001650			
10,800	54,000	.004600	.001100			
11,000	55,000	.006250	.001650			
11,200	56,000	.008000	.001750			
11,400	57,000	.009000	.001000			
11,600	58,000	.009850	.000850			
11,800	59,000	.010900	.001050			
12,000	60,000	.012000	.001100			
12,400	62,000	.013900	.001900			
12,800	64,000	.015650	.001750			
13,200	66,000	.017650	.002000			
13,600	68,000	.019850	.002200			
14,000	70,000	.022500	.002650			
14,400	72,000	.025500	.003000			
14,800	74,000	.029000	.003500			
15,200	76,000	.032250	.003250			
15,600	78,000	.035600	.003350			
16,000	80,000	.039000	.003400			
16,400	82,000	.043900	.004900			
16,800	84,000	.049850	.005950			
17,200	86,000	.057500	.007650			
17,600	88,000	.0650	.0075			
18,000	90,000	.0850	.0200			
18,380	91,900	.1350	.0500			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	91,900
Elastic limit per square inch of original section	do	51,000
Elongation per inch after rupture	inch	0.2350
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		".65 from neck
Character of broken surface		silky
Elongation of inch sections		",36*,".11

BREECH BLOCKS.

No. 3283.

Marks, $\frac{\text{82 Res BB}}{T_1 \text{ M}}$
Diameter, ".503.
Sectional area, .20 square inch.

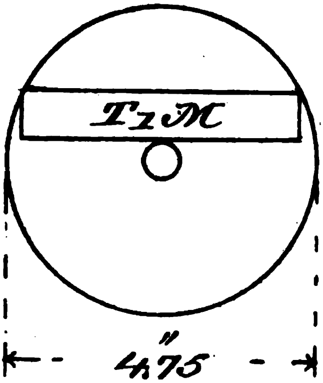
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	,000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	,001700	.000250	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	
10,600	53,000	.001850	.000050	....	....	
10,800	54,000	.001900	.000050	....	....	Elastic limit.
11,000	55,000	.002050	.000150	....	....	
11,200	56,000	.002500	.000450	....	....	
11,400	57,000	.003200	.000700	....	....	
11,600	58,000	.004000	.000800	....	....	
11,800	59,000	.005000	.001000	....	....	
12,000	60,000	.005750	.000750	....	....	
12,400	62,000	.007500	.001750	....	....	
12,800	64,000	.009600	.002100	....	....	
13,200	66,000	.011050	.001450	....	....	
13,600	68,000	.013050	.002000	....	....	
14,000	70,000	.015100	.002050	....	....	
14,400	72,000	.017100	.002000	....	....	
14,800	74,000	.018800	.001700	....	....	
15,200	76,000	.021200	.002400	....	....	
15,600	78,000	.023800	.002600	....	....	
16,000	80,000	.026700	.002900	....	....	
16,400	82,000	.029250	.002550	....	....	
16,800	84,000	.032100	.002850	....	....	
17,200	86,000	.035850	.003750	....	....	
17,600	88,000	.039250	.003400	....	....	
18,000	90,000	.043750	.004500	....	....	
18,400	92,000	.050000	.006250	....	....	
18,800	94,000	.056750	.006750	....	....	
19,200	96,000	.0650	.008250	....	....	
19,600	98,000	.0800	.0150	....	....	
19,930	99,650	.1100	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	99,650
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.1650
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.093
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		".48 from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		".10, ".23

3.2 inch Steel B. L. Rifles

Breech blocks



H Ex No 16 50. 1.

No. 3338.

Marks, $^{32}\frac{R_{a}\,BB}{T,\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000300	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001650	.000200	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	
10,600	53,000	.001750	0.	....	....	
10,800	54,000	.001800	.000050	....	....	
11,000	55,000	.001800	0.	....	....	
11,200	56,000	.001900	.000100	....	....	Elastic limit.
11,400	57,000	.002100	.000200	....	....	
11,600	58,000	.002600	.000500	....	....	
11,800	59,000	.003200	.000600	....	....	
12,000	60,000	.004250	.001050	....	....	
12,400	62,000	.006750	.002500	....	....	
12,800	64,000	.008750	.002000	....	....	
13,200	66,000	.010200	.001450	....	....	
13,600	68,000	.011100	.000900	....	....	
14,000	70,000	.012900	.001800	....	....	
14,400	72,000	.015050	.002150	....	....	
14,800	74,000	.016750	.001700	....	....	
15,200	76,000	.018750	.002000	....	....	
15,600	78,000	.020600	.001850	....	....	
16,000	80,000	.022650	.002050	....	....	
16,400	82,000	.025100	.002550	....	....	
16,800	84,000	.028250	.003150	....	....	
17,200	86,000	.030000	.001750	....	....	
17,600	88,000	.033250	.003250	....	....	
18,000	90,000	.036750	.003500	....	....	
18,400	92,000	.040300	.003550	....	....	
18,800	94,000	.046000	.005700	....	....	
19,200	96,000	.051250	.005250	....	....	
19,600	98,000	.059350	.008100	....	....	
20,000	100,000	.0650	.005650	....	....	
20,400	102,000	.0900	.0250	....	....	
20,540	102,700	.1150	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102,700
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.1550
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.085
Reduction in area after rupture, per centum of original section		30.7
Position of rupture		″.45 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.10, ″.21*

No. 3323.

Marks, $^{32}\frac{\text{Re BB}}{\text{T}_1\text{ M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
10,000	50,000	.001650	.000150	....	....	
10,200	51,000	.001700	.000050	....	....	
10,400	52,000	.001750	.000050	....	....	Elastic limit.
10,600	53,000	.002100	.000350	....	....	
10,800	54,000	.002900	.000800	....	....	
11,000	55,000	.003500	.000600	....	....	
11,200	56,000	.004250	.000750	....	....	
11,400	57,000	.005050	.000800	....	....	
11,600	58,000	.005850	.000800	....	....	
11,800	59,000	.006600	.000750	....	....	
12,000	60,000	.007550	.000950	....	....	
12,400	62,000	.009050	.001500	....	....	
12,800	64,000	.010850	.001800	....	....	
13,200	66,000	.012550	.001700	....	....	
13,600	68,000	.014500	.001950	....	....	
14,000	70,000	.016400	.001900	....	....	
14,400	72,000	.018500	.002100	....	....	
14,800	74,000	.020500	.002000	....	....	
15,200	76,000	.022550	.002050	....	....	
15,600	78,000	.025050	.002500	....	....	
16,000	80,000	.027500	.002450	....	....	
16,400	82,000	.030500	.003000	....	....	
16,800	84,000	.034000	.003500	....	....	
17,200	86,000	.037250	.003250	....	....	
17,600	88,000	.041750	.004500	....	....	
18,000	90,000	.046500	.004750	....	....	
18,400	92,000	.053000	.006500	....	....	
18,800	94,000	.061500	.008500	....	....	
19,200	96,000	.0675	.0060	....	....	
19,600	98,000	.0850	.0175	....	....	
19,700	98,500	.1200	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	98,500
Elastic limit per square inch of original section	do	52,000
Elongation per inch after rupture	inch	0.2000
Elongation per inch under strain at elastic limit	do	.001750
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		40.3
Position of rupture		1″.20 from neck
Character of broken surface		silky
Elongation of inch sections		″.16, ″.24*

No. 3268.

Marks, 22 Ra B B T1 M
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001550	.000150	....	....	
10,200	51,000	.001600	.000050	....	....	
10,400	52,000	.001650	.000050	....	....	
10,600	53,000	.001700	.000150	....	....	
10,800	54,000	.001800	.000100	....	....	Elastic limit.
11,000	55,000	.002150	.000350	....	....	
11,200	56,000	.002750	.000600	....	....	
11,400	57,000	.003750	.001000	....	....	
11,600	58,000	.004650	.000900	....	....	
11,800	59,000	.005550	.000900	....	....	
12,000	60,000	.006250	.000700	....	....	
12,400	62,000	.008050	.001800	....	....	
12,800	64,000	.009850	.001800	....	....	
13,200	66,000	.011700	.001850	....	....	
13,600	68,000	.013350	.001650	....	....	
14,000	70,000	.015200	.001850	....	....	
14,400	72,000	.017100	.001900	....	....	
14,800	74,000	.019150	.002050	....	....	
15,200	76,000	.021000	.001850	....	....	
15,600	78,000	.023550	.002550	....	....	
16,000	80,000	.026100	.002550	....	....	
16,400	82,000	.028800	.002700	....	....	
16,800	84,000	.031850	.003050	....	....	
17,200	86,000	.035100	.003250	....	....	
17,600	88,000	.039050	.003950	....	....	
18,000	90,000	.043750	.004700	....	....	
18,400	92,000	.049050	.005300	....	....	
18,800	94,000	.056500	.007450	....	....	
19,200	96,000	.0625	.0060	....	....	
19,600	98,000	.0850	.0225	....	....	
19,960	99,800	.1350	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	99,800
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		″.93 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.15, ″.25*

No. 3284.

Marks, $^{32\text{ R. B B}}_{\text{T, M}}$
Diameter, ″.504.
Sectional area, .20 square inch.

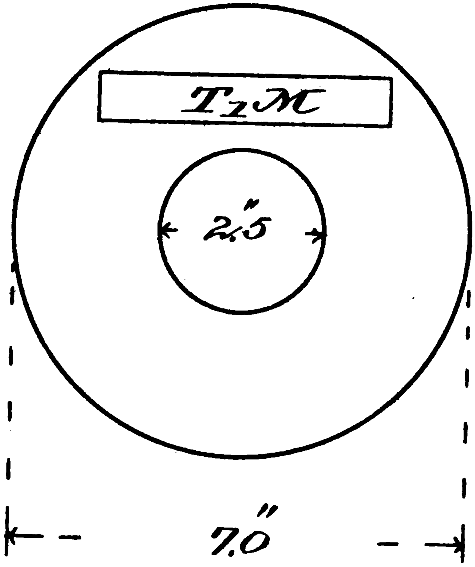
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000700	.000150	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
10,000	50,000	.001700	.000200	....	....	
10,200	51,000	.001750	.000050	....	....	
10.400	52,000	.001850	.000100	....	....	Elastic limit.
10,600	53,000	.002000	.000150	....	....	
10,800	54,000	.002350	.000350	....	....	
11,000	55,000	.002800	.000450	....	....	
11,200	56,000	.003350	.000550	....	....	
11,400	57,000	.004[illegible]50	.000900	....	....	
11,600	58,000	.005200	.000950	....	....	
11,800	59,000	.006000	.000800	....	....	
12,000	60,000	.007050	.001050	....	....	
12,400	62,000	.009350	.002300	....	....	
12,800	64,000	.011350	.002000	....	....	
13,200	66,000	.013050	.001700	....	....	
13,600	68,000	.015000	.001950	....	....	
14,000	70,000	.017100	.002100	....	....	
14,400	72,000	.019100	.002000	....	....	
14,800	74,000	.021350	.002250	....	....	
15,200	76,000	.024000	.002650	....	....	
15,600	78,000	.026750	.002750	....	....	
16,000	80,000	.029100	.002350	....	....	
16,400	82,000	.032750	.003650	....	....	
16,800	84,000	.037000	.004250	....	....	
17,200	86,000	.041250	.004250	....	....	
17,600	88,000	.045000	.003750	....	....	
18,000	90,000	.051000	.006000	....	....	
18,400	92,000	.059250	.008250	....	....	
18,800	94,000	.0650	.005750	....	....	
19,200	96,000	.0900	.0250	....	....	
19,320	96,600	.1050	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 96,600
Elastic limit per square inch of original section..................................do.... 52,000
Elongation per inch after rupture..................................inch.. 0.1950
Elongation per inch under strain at elastic limit..................................do.... .001850
Reduction in diameter at point of rupture..................................do.... .114
Reduction in area after rupture, per centum of original section.................................. 40.3
Position of rupture..................................1″.05 from neck
Character of broken surface..................................silky
Elongation of inch sections..................................″.13, ″.26*

3.2 inch Steel B.L. Rifles

Base rings



BASE RINGS.

No. 3263.

Marks, $\genfrac{}{}{0pt}{}{^{82}\ \text{Res B R}}{\text{T}_1\ \text{M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	. 000100	. 000100	—. 000050	—. 000050	
2, 000	10, 000	. 000250	. 000150	—. 000050	0.	
3, 000	15, 000	. 000400	. 000150	—. 000050	0.	
4, 000	20, 000	. 000550	. 000150	—. 000050	0.	
5, 000	25, 000	. 000700	. 000150	—. 000100	—. 000050	
6, 000	30, 000	. 000850	. 000150	—. 000100	0.	
7, 000	35, 000	. 001000	. 000150	—. 000100	0.	
8, 000	40, 000	. 001150	. 000150	—. 000100	0.	
9, 000	45, 000	. 001300	. 000150	....	....	
10, 000	50, 000	. 001550	. 000250	....	....	
10, 200	51, 000	. 001550	0.	....	....	
10, 400	52, 000	. 001600	. 000050	....	....	
10, 600	53, 000	. 001650	. 000050	....	....	Elastic limit.
10, 800	54, 000	. 001800	. 000150	....	....	
11, 000	55, 000	. 002000	. 000200	....	....	
12, 200	56, 000	. 002850	. 000850	....	....	
11, 400	57, 000	. 004100	. 001250	....	....	
11, 600	58, 000	. 005250	. 001150	....	....	
11, 800	59, 000	. 006350	. 001100	....	....	
12, 000	60, 000	. 007250	. 000900	....	....	
12, 400	62, 000	. 009000	. 001750	....	....	
12, 800	64, 000	. 011000	. 002000	....	....	
13, 200	66, 000	. 013000	. 002000	....	....	
13, 600	68, 000	. 014750	. 001750	....	....	
14, 000	70, 000	. 016750	. 002000	....	....	
14, 400	72, 000	. 019250	. 002500	....	....	
14, 800	74, 000	. 021500	. 002250	....	....	
15, 200	76, 000	. 024000	. 002500	....	....	
15, 600	78, 000	. 026500	. 002500	....	....	
16, 000	80, 000	. 029250	. 002750	....	....	
16, 400	82, 000	. 032750	. 003500	....	....	
16, 800	84, 000	. 036500	. 003750	....	....	
17, 200	86, 000	. 040600	. 004100	....	....	
17, 600	88, 000	. 045550	. 004950	....	....	
18, 000	90, 000	. 052500	. 006950	....	....	
18, 400	92, 000	. 060250	. 007750	....	....	
18, 800	94, 000	. 0750	. 014750	....	....	
19, 200	96, 000	. 1000	. 0250	....	....	
19, 280	96, 400	. 1350	. 0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 96, 400
Elastic limit per square inch of original section....................do.... 53, 000
Elongation per inch after rupture....................inch.. 0. 2150
Elongation per inch under strain at elastic limit....................do .... .001650
Reduction in diameter at point of rupture....................do.... .135
Reduction in area after rupture, per centum of original section.................... 46. 2
Position of rupture....................".85 from neck
Character of broken surface....................silky
Elongation of inch sections....................".11, ".32*

No. 3264.

Marks, $^{82}\frac{B_{2}}{T_{1}}\frac{B\ R}{M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000700	.000150	0.	....	
6,000	30,000	.000850	.000150	0.	....	
7,000	35,000	.001000	.000150	0.	....	
8,000	40,000	.001200	.000200	0.	....	
9,000	45,000	.001350	.000150	....	....	
10,000	50,000	.001550	.000200	....	....	
10,200	51,000	.001600	.000050	....	....	
10,400	52,000	.001600	0.	....	....	
10,600	53,000	.001650	.000050	....	....	Elastic limit.
10,800	54,000	.001800	.000150	....	....	
11,000	55,000	.002050	.000250	....	....	
11,200	56,000	.002850	.000800	....	....	
11,400	57,000	.003500	.000650	....	....	
11,600	58,000	.004600	.001100	....	....	
11,800	59,000	.005500	.000900	....	....	
12,000	60,000	.006500	.001000	....	....	
12,400	62,000	.007750	.001250	....	....	
12,800	64,000	.009500	.001750	....	....	
13,200	66,000	.011350	.001850	....	....	
13,600	68,000	.013250	.001900	....	....	
14,000	70,000	.015250	.002000	....	....	
14,400	72,000	.018050	.002800	....	....	
14,800	74,000	.019550	.001500	....	....	
15,200	76,000	.021250	.001700	....	....	
15,600	78,000	.023500	.002250	....	....	
16,000	80,000	.025850	.002350	....	....	
16,400	82,000	.028500	.002650	....	....	
16,800	84,000	.031250	.002750	....	....	
17,200	86,000	.034200	.002950	....	....	
17,600	88,000	.038000	.003800	....	....	
18,000	90,000	.042100	.004100	....	....	
18,400	92,000	.048500	.006400	....	....	
18,800	94,000	.054500	.006000	....	....	
19,200	96,000	.0600	.0055	....	....	
19,600	98,000	.0700	.0100	....	....	
20,000	100,000	.1000	.0300	....	....	
20,080	100,400	.1200	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 100,400
Elastic limit per square inch of original section ....do.... 53,000
Elongation per inch after rupture..inch.. 0.1550
Elongation per inch under strain at elastic limit...do.... .001650
Reduction in diameter at point of rupture...do.... .065
Reduction in area after rupture, per centum of original section 23.9
Position of rupture...″.60 from neck
Character of broken surface..................granular, radiating from a dull spot at the circumference
Elongation of inch sections ....″19,* ″.12

No. 2365.

Marks, $\genfrac{}{}{0pt}{}{32\ R_{65}\ B\ R}{T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000850	.000100	0.	....	
7,000	35,000	.001050	.000200	0.	....	
8,000	40,000	.001200	.000150	0.	....	
9,000	45,000	.001400	.000200	....	....	
10,000	50,000	.001650	.000250	....	....	
10,200	51,000	.001700	.000050	....	....	Elastic limit.
10,400	52,000	.002050	.000350	....	....	
10,600	53,000	.002950	.000900	....	....	
10,800	54,000	.003750	.000800	....	....	
11,000	55,000	.004500	.000750	....	....	
11,200	56,000	.005500	.001000	....	....	
11,400	57,000	.006250	.000750	....	....	
11,600	58,000	.007250	.001000	....	....	
11,800	59,000	.008100	.000850	....	....	
12,000	60,000	.009000	.000900	....	....	
12,400	62,000	.010750	.001750	....	....	
12,800	64,000	.012750	.002000	....	....	
13,200	66,000	.014500	.001750	....	....	
13,600	68,000	.016250	.001750	....	....	
14,000	70,000	.018250	.002000	....	....	
14,400	72,000	.020750	.002500	....	....	
14,800	74,000	.023250	.002500	....	....	
15,200	76,000	.026000	.002750	....	....	
15,600	78,000	.028500	.002500	....	....	
16,000	80,000	.031250	.002750	....	....	
16,400	82,000	.034750	.003500	....	....	
16,800	84,000	.039000	.004250	....	....	
17,200	86,000	.043250	.004250	....	....	
17,600	88,900	.049500	.006250	....	....	
18,000	90,000	.055750	.006250	....	....	
18,400	92,000	.0600	.004250	....	....	
18,800	94,000	.0850	.0250	....	....	
19,130	95,650	.1250	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	95,650
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2350
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.90 from neck
Character of broken surface		silky
Elongation of inch sections		″.34*, ″.13

No. 3566.

Marks, $^{32\,R_4\,B\,B}_{\quad T,\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.	....	
2, 000	10, 000	.000250	.000150	0.	....	
3, 000	15, 000	.000400	.000150	0.	....	
4, 000	20, 000	.000550	.000150	0.	....	
5, 000	25, 000	.000750	.000200	0.	....	
6, 000	30, 000	.000900	.000150	0.	....	
7, 000	35, 000	.001100	.000200	0.	....	
8, 000	40, 000	.001250	.000150	0.	....	
9, 000	45, 000	.001400	.000150	....	....	
10, 000	50, 000	.001550	.000150	....	....	Elastic limit.
10, 200	51, 000	.001700	.000150	....	....	
10, 400	52, 000	.002200	.000500	....	....	
10, 600	53, 000	.003650	.001450	....	....	
10, 800	54, 000	.005250	.001600	....	....	
11, 000	55, 000	.006500	.001250	....	....	
11, 200	56, 000	.007000	.000500	....	....	
11, 400	57, 000	.007500	.000500	....	....	
11, 600	58, 000	.008000	.000500	....	....	
11, 800	59, 000	.008750	.000750	....	....	
12, 000	60, 000	.009750	.001000	....	....	
12, 400	62, 000	.011850	.002100	....	....	
12, 800	64, 000	.013600	.001750	....	....	
13, 200	66, 000	.015350	.001750	....	....	
13, 600	68, 000	.017700	.002350	....	....	
14, 000	70, 000	.020350	.002650	....	....	
14, 400	72, 000	.022750	.002400	....	....	
14, 800	74, 000	.025000	.002250	....	....	
15, 200	76, 000	.027350	.002350	....	....	
15, 600	78, 000	.030100	.002750	....	....	
16, 000	80, 000	.033500	.003400	....	....	
16, 400	82, 000	.037050	.003550	....	....	
16, 800	84, 000	.041750	.004700	....	....	
17, 200	86, 000	.047000	.005250	....	....	
17, 600	88, 000	.053750	.006750	....	....	
18, 000	90, 000	.061500	.007750	....	....	
18, 400	92, 000	.0750	.0135	....	....	
18, 800	94, 000	.1050	.0300	....	....	
18, 850	94, 250	.1250	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	94, 250
Elastic limit per square inch of original section ....do....	50, 000
Elongation per inch after rupture ....inch..	0. 2400
Elongation per inch under strain at elastic limit ....do....	.001550
Reduction in diameter at point of rupture ....do....	.125
Reduction in area after rupture, per centum of original section	43. 3
Position of rupture	″.95 from neck
Character of broken surface	silky
Elongation of inch sections	″.17, ″.21

No. 3267.

Marks, $\overset{32\ \text{Re}\ \text{B R}}{\text{Ti M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.		
2,000	10,000	.000300	.000200	0.		
3,000	15,000	.000400	.000100	0.		
4,000	20,000	.000600	.000200	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000900	.000150	0.		
7,000	35,000	.001050	.000150	0.		
8,000	40,000	.001200	.000150	0.		
9,000	45,000	.001350	.000150			
9,200	46,000	.001400	.000050			
9,400	47,000	.001450	.000050			
9,600	48,000	.001550	.000100			Elastic limit.
9,800	49,000	.001850	.000300			
10,000	50,000	.004900	.003050			
10,200	51,000	.006000	.001100			
10,400	52,000	.006500	.000500			
10,600	53,000	.007100	.000600			
10,800	54,000	.008050	.000950			
11,000	55,000	.009350	.001300			
11,200	56,000	.010150	.000800			
11,400	57,000	.011000	.000850			
11,600	58,000	.012000	.001000			
11,800	59,000	.013100	.001100			
12,000	60,000	.014250	.001150			
12,400	62,000	.016050	.001800			
12,800	64,000	.018500	.002450			
13,200	66,000	.020600	.002100			
13,600	68,000	.023100	.002500			
14,000	70,000	.025850	.002750			
14,400	72,000	.029500	.003650			
14,800	74,000	.032500	.003000			
15,200	76,000	.036000	.003500			
15,600	78,000	.041000	.005000			
16,000	80,000	.046300	.005300			
16,400	82,000	.052750	.006450			
16,800	84,000	.061500	.008750			
17,200	86,000	.0750	.0135			
17,600	88,000	.1000	.0250			
17,840	89,200	.1450	.0450			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89,200
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.2650
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.35, ″.13

KEY RINGS.

No. 3261.

Marks, $^{82}\frac{\text{Rs K B}}{\text{T, M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

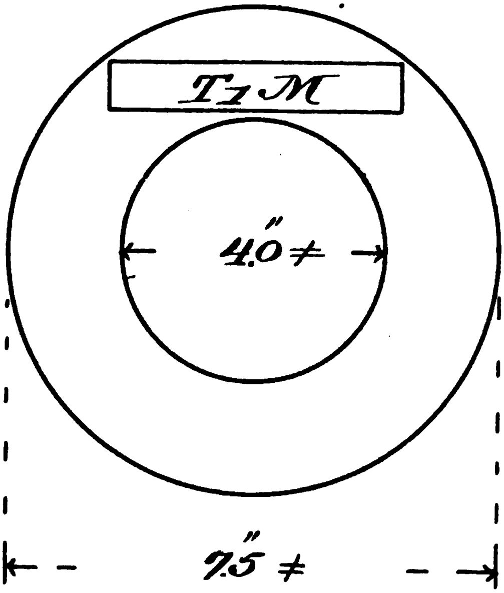
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	Elastic limit.
10,600	53,000	.001800	.000100	....	....	
10,800	54,000	.003400	.001600	....	....	
11,000	55,000	.004750	.001350	....	....	
11,200	56,000	.006200	.001450	....	....	
11,400	57,000	.007000	.000800	....	....	
11,600	58,000	.008100	.001100	....	....	
11,800	59,000	.008900	.000800	....	....	
12,000	60,000	.009400	.000500	....	....	
12,400	62,000	.010500	.001100	....	....	
12,800	64,000	.012500	.002000	....	....	
13,200	66,000	.014900	.002400	....	....	
13,600	68,000	.017000	.002100	....	....	
14,000	70,000	.018700	.001700	....	....	
14,400	72,000	.021100	.002400	....	....	
14,800	74,000	.023000	.001900	....	....	
15,200	76,000	.025700	.002700	....	....	
15,600	78,000	.028750	.003050	....	....	
16,000	80,000	.031650	.002900	....	....	
16,400	82,000	.035250	.003600	....	....	
16,800	84,000	.039250	.004000	....	....	
17,200	86,000	.044000	.004750	....	....	
17,600	88,000	.050250	.006250	....	....	
18,000	90,000	.056250	.006000	....	....	
18,400	92,000	.0625	.006250	....	....	
18,800	94,000	.0800	.0175	....	....	
19,200	96,000	.1150	.0350	....	....	
19,220	96,100	.1500	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	96,100
Elastic limit per square inch of original section .... do....	52,000
Elongation per inch after rupture .... inch..	0.2400
Elongation per inch under strain at elastic limit .... do....	.001700
Reduction in diameter at point of rupture .... do....	.135
Reduction in area after rupture, per centum of original section	46.2
Position of rupture	1″.10 from neck
Character of broken surface	silky
Elongation of inch sections	″.31*, ″.17

3.2 inch steel B.L. Rifles

Key rings



No. 3277.

Marks, $^{22}\frac{R_{n}\,K\,R}{T_{1}\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200	0.	....	
2,000	10,000	.000350	.000150	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000700	.000150	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001400	.000200	0.	....	
9,000	45,000	.001550	.000150	....	....	
10,000	50,000	.001750	.000200	....	....	
10,200	51,000	.001750	0.	....	....	Elastic limit.
10,400	52,000	.006000	.004250	....	....	
10,600	53,000	.007000	.001000	....	....	
10,800	54,000	.007750	.000750	....	....	
11,000	55,000	.008600	.000850	....	....	
11,200	56,000	.009550	.000950	....	....	
11,400	57,000	.010350	.000800	....	....	
11,600	58,000	.011250	.000900	....	....	
11,800	59,000	.012100	.000850	....	....	
12,000	60,000	.013050	.000950	....	....	
12,400	62,000	.015100	.002050	....	....	
12,800	64,000	.017250	.002150	....	....	
13,200	66,000	.019500	.002250	....	....	
13,600	68,000	.021750	.002250	....	....	
14,000	70,000	.024000	.002250	....	....	
14,400	72,000	.026350	.002350	....	....	
14,800	74,000	.029750	.003400	....	....	
15,200	76,000	.033000	.003250	....	....	
15,600	78,000	.036650	.003650	....	....	
16,000	80,000	.041300	.004650	....	....	
16,400	82,000	.047000	.005700	....	....	
16,800	84,000	.052400	.005400	....	....	
17,200	86,000	.060350	.007950	....	....	
17,600	88,000	.0675	.007150	....	....	
18,000	90,000	.0900	.0225	....	....	
18,280	91,400	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91,400
Elastic limit per square inch of original section	do ...	51,000
Elongation per inch after rupture	inch..	0.2600
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.16, ″.36*

No. 3285.

Marks, $^{32}\frac{R_{R}\ K\ B}{T_1\ M}$

Diameter, ″.504.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	—.000050	—.000050	
2, 000	10, 000	.000300	.000150	—.000050	0.	
3, 000	15, 000	.000450	.000150	—.000050	0.	
4, 000	20, 000	.000600	.000150	—.000050	0.	
5, 000	25, 000	.000750	.000150	—.000050	0.	
6, 000	30, 000	.000900	.000150	—.000050	0.	
7, 000	35, 000	.001050	.000150	—.000050	0.	
8, 000	40, 000	.001200	.000150	—.000050	0.	
9, 000	45, 000	.001400	.000200	....	....	
9, 200	46, 000	.001450	.000050	....	....	Elastic limit.
9, 400	47, 000	.003000	.001550	....	....	
9, 600	48, 000	.004750	.001750	....	....	
9, 800	49, 000	.005850	.001100	....	....	
10, 000	50, 000	.006900	.001050	....	....	
10, 200	51, 000	.007800	.000900	....	....	
10, 400	52, 000	.008600	.000800	....	....	
10, 600	53, 000	.009550	.000950	....	....	
10, 800	54, 000	.010550	.001000	....	....	
11, 000	55, 000	.011500	.000950	....	....	
11, 200	56, 000	.012350	.000850	....	....	
11, 400	57, 000	.013500	.001150	....	....	
11, 600	58, 000	.014600	.001100	....	....	
11, 800	59, 000	.015750	.001150	....	....	
12, 000	60, 000	.017000	.001250	....	....	
12, 400	62, 000	.019250	.002250	....	....	
12, 800	64, 000	.022000	.002750	....	....	
18, 200	66, 000	.024350	.002350	....	....	
13, 600	68, 000	.027750	.003400	....	....	
14, 000	70, 000	.031250	.003500	....	....	
14, 400	72, 000	.035000	.003750	....	....	
14, 800	74, 000	.039050	.004050	....	....	
15, 200	76, 000	.044250	.005200	....	....	
15, 600	78, 000	.051000	.006750	....	....	
16, 000	80, 000	.059750	.008750	....	....	
16, 400	82, 000	.0700	.010250	....	....	
16, 800	84, 000	.0900	.0200	....	....	
17, 120	85, 600	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 85, 600
Elastic limit per square inch of original section..............................do ... 46, 000
Elongation per inch after rupture..............................inch.. 0. 2500
Elongation per inch under strain at elastic limit..............................do.... .001450
Reduction in diameter at point of rupture..............................do.... .114
Reduction in area after rupture, per centum of original section.............................. 40. 3
Position of rupture..............................1″ from neck
Character of broken surface..............................silky; fine cracks opened in surface of stem
Elongation of inch sections..............................″.33*, ″.17

No. 3286.

Marks, $^{22}\frac{R_4}{T}, \frac{K\ R}{M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001200	.000200	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001550	.000200	....	....	
9,200	46,000	.001600	.000050	....	....	
9,400	47,000	.001600	0.	....	....	
9,600	48,000	.001650	.000050	....	....	
9,800	49,000	.001700	.000050	....	....	
10,000	50,000	.001750	.000050	....	....	
10,200	51,000	.001800	.000050	....	....	Elastic limit.
10,400	52,000	.005200	.003400	....	....	
10,600	53,000	.005950	.000750	....	....	
10,800	54,000	.007100	.001150	....	....	
11,000	55,000	.008000	.000900	....	....	
11,200	56,000	.009100	.001100	....	....	
11,400	57,000	.010350	.001250	....	....	
11,600	58,000	.011350	.001000	....	....	
11,800	59,000	.012200	.000850	....	....	
12,000	60,000	.013250	.001050	....	....	
12,400	62,000	.015300	.002050	....	....	
12,800	64,000	.017600	.002300	....	....	
13,200	66,000	.020000	.002400	....	....	
13,600	68,000	.022250	.002250	....	....	
14,000	70,000	.025000	.002750	....	....	
14,400	72,000	.027800	.002800	....	....	
14,800	74,000	.031500	.003700	....	....	
15,200	76,000	.034900	.003400	....	....	
15,600	78,000	.039250	.004350	....	....	
16,000	80,000	.044750	.005500	....	....	
16,400	82,000	.051250	.006500	....	....	
16,800	84,000	.058550	.007300	....	....	
17,200	86,000	.0675	.008950	....	....	
17,600	88,000	.1000	.0325	....	....	
17,720	88,600	.1300	.0300	....	....	Tensile strength.

General summary:

Tensile strength per square inch of original section	pounds..	88,600
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2200
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.155
Reduction in area after rupture, per centum of original section		51.9
Position of rupture		1″.10 from neck
Character of broken surface		silky
Elongation of inch sections		″.27*, ″.17

No. 3262.

Marks, $^{32}\,\mathrm{R_{ss}}\,\frac{\mathrm{K}}{\mathrm{T,\ M}}\,\mathrm{R}$
Diameter, ″.505.
Sectional area, .20 square inch.

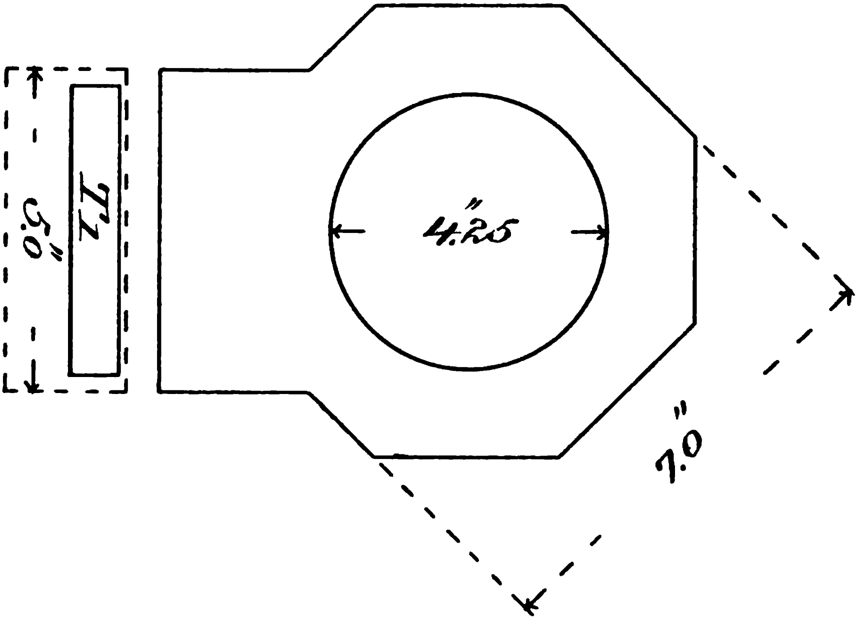
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	Elastic limit.
10,400	52,000	.002000	.000350	....	....	
10,600	53,000	.002650	.000650	....	....	
10,800	54,000	.005650	.003000	....	....	
11,000	55,000	.006700	.001050	....	....	
11,200	56,000	.007500	.000800	....	....	
11,400	57,000	.008500	.001000	....	....	
11,600	58,000	.009250	.000750	....	....	
11,800	59,000	.010250	.001000	....	....	
12,000	60,000	.011500	.001250	....	....	
12,400	62,000	.013350	.001850	....	....	
12,800	64,000	.015250	.001900	....	....	
13,200	66,000	.017300	.002050	....	....	
13,600	68,000	.019150	.001850	....	....	
14,000	70,000	.021500	.002350	....	....	
14,400	72,000	.024000	.002500	....	....	
14,800	74,000	.026750	.002750	....	....	
15,200	76,000	.029500	.002750	....	....	
15,600	78,000	.033250	.003750	....	....	
16,000	80,000	.037000	.003750	....	....	
16,400	82,000	.041000	.004000	....	....	
16,800	84,000	.047000	.006000	....	....	
17,200	86,000	.053250	.006250	....	....	
17,600	88,000	.063000	.009750	....	....	
18,000	90,000	.0800	.0170	....	....	
18,400	92,000	.1050	.0250	....	....	
18,480	92,400	.1300	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	92,400
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2150
Elongation per inch under strain at elastic limit	do....	.001650
Reduction in diameter at point of rupture	do....	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.60 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.10

3.2 inch Steel B.L. Rifles

Block carriers



BLOCK CARRIERS.

No. 3269.

Marks, 32 Res B C T.
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	. 000100	. 000100	0.	....	
2, 000	10, 000	. 000250	. 000150	0.	....	
3, 000	15, 000	. 000400	. 000150	0.	....	
4, 000	20, 000	. 000550	. 000150	0.	....	
5, 000	25, 000	. 000700	. 000150	0.	....	
6, 000	30, 000	. 000850	. 000150	0.	....	
7, 000	35, 000	. 001000	. 000150	0.	....	
8, 000	40, 000	. 001200	. 000200	. 000050	. 000050	
9, 000	45, 000	. 001350	. 000150	....	....	
10, 000	50, 000	. 001500	. 000150	....	....	Elastic limit.
10, 200	51, 000	. 001650	. 000150	....	....	
10, 400	52, 000	. 001750	. 000100	....	....	
10, 600	53, 000	. 002500	. 000750	....	....	
10, 800	54, 000	. 003500	. 001000	....	....	
11, 000	55, 000	. 004350	. 000850	....	....	
11, 200	56, 000	. 005400	. 001050	....	....	
11, 400	57, 000	. 006400	. 001000	....	....	
11, 600	58, 000	. 007400	. 001000	....	....	
11, 800	59, 000	. 008250	. 000850	....	....	
12, 000	60, 000	. 009400	. 001150	....	....	
12, 400	62, 000	. 011150	. 001750	....	....	
12, 800	64, 000	. 013150	. 002000	....	....	
13, 200	66, 000	. 015200	. 002050	....	....	
13, 600	68, 000	. 017400	. 002200	....	....	
14, 000	70, 000	. 019550	. 002150	....	....	
14, 400	72, 000	. 022100	. 002550	....	....	
14, 800	74, 000	. 024750	. 002650	....	....	
15, 200	76, 000	. 027250	. 002500	....	....	
15, 600	78, 000	. 030600	. 003350	....	....	
16, 000	80, 000	. 034050	. 003450	....	....	
16, 400	82, 000	. 038100	. 004050	....	....	
16, 800	84, 000	. 043250	. 005150	....	....	
17, 200	86, 000	. 049050	. 005800	....	....	
17, 600	88, 000	. 055500	. 006450	....	....	
18, 000	90, 000	. 066000	. 010500	....	....	
18, 400	92, 000	. 0850	. 0190	....	....	
18, 710	93, 550	. 1200	. 0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93, 550
Elastic limit per square inch of original section	do....	50, 000
Elongation per inch after rupture	inch..	0. 2250
Elongation per inch under strain at elastic limit	do....	. 001500
Reduction in diameter at point of rupture	do....	. 155
Reduction in area after rupture, per centum of original section		51. 9
Position of rupture		1″.20 from neck
Character of broken surface		silky
Elongation of inch sections		″.20, ″.25.

No. 3270.

Marks, $\overset{22\,\text{B}_{22}\,\text{B C}}{\text{T}}$,
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0,	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001400	.050150	....	....	
10,000	50,000	.001550	.000150	....	....	
10,200	51,000	.001600	.000050	....	....	
10,400	52,000	.001600	0.	....	....	
10,600	53,000	.001700	.000100	....	....	Elastic limit.
10,800	54,000	.001850	.000150	....	....	
11,000	55,000	.002700	.000850	....	....	
11,200	56,000	.003900	.001200	....	....	
11,400	57,000	.004800	.000900	....	....	
11,600	58,000	.005750	.000950	....	....	
11,800	59,000	.006750	.001000	....	....	
12,000	60,000	.007600	.000850	....	....	
12,400	62,000	.008800	.001200	....	....	
12,800	64,000	.011550	.002750	....	....	
13,200	66,000	.013500	.001950	....	....	
13,600	68,000	.015600	.002100	....	....	
14,000	70,000	.017600	.002000	....	....	
14,400	72,000	.019850	.002250	....	....	
14,800	74,000	.022250	.002400	....	....	
15,200	76,000	.024600	.002350	....	....	
15,600	78,000	.027400	.002800	....	....	
16,000	80,000	.030600	.003200	....	....	
16,400	82,000	.033900	.003300	....	....	
16,800	84,000	.038050	.004150	....	....	
17,200	86,000	.042100	.004050	....	....	
17,600	88,000	.049000	.006900	....	....	
18,000	90,000	.054250	.005250	....	....	
18,400	92,000	.0575	.003250	....	....	
18,800	94,000	.0700	.0125	....	....	
19,200	96,000	.1000	.0300	....	....	
19,260	96,800	.1350	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	96,800
Elastic limit per square inch of original section	do.	53,000
Elongation per inch after ruptnre	inch	0.2350
Elongation per inch under strain at elastic limit	do.	.001700
Reduction in diameter at point of rupture	do.	.145
Reduction in area after rupture, per centum of original section		49.1
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.14

No. 3271.

Marks, $^{32}\frac{\text{R}_{ss}}{\text{T}_1}\text{BC}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.		
2,000	10,000	.000250	.000150	0.		
3,000	15,000	.000450	.000200	0.		
4,000	20,000	.000600	.000150	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000900	.000150	0.		
7,000	35,000	.001050	.000150	0.		
8,000	40,000	.001200	.000150	0.		
9,000	45,000	.001850	.000150			
10,000	50,000	.001500	.000150			
10,200	51,000	.001550	.000050			
10,400	52,000	.001650	.000100			
10,600	53,000	.001700	.000050			
10,800	54,000	.001750	.000050			
11,000	55,000	.001800	.000050			
11,200	56,000	.001850	.000050			
11,400	57,000	.001900	.000050			
11,600	58,000	.001950	.000050			
11,800	59,000	.001950	0.			Elastic limit.
12,000	60,000	.002050	.000100			
12,200	61,000	.003000	.000950			
12,400	62,000	.004000	.001000			
12,800	64,000	.006000	.002000			
13,200	66,000	.008000	.002000			
13,600	68,000	.009500	.001500			
14,000	70,000	.011150	.001650			
14,400	72,000	.012750	.001600			
14,800	74,000	.014500	.001750			
15,200	76,000	.016500	.002000			
15,600	78,000	.018350	.001850			
16,000	80,000	.020250	.001900			
16,400	82,000	.022350	.002100			
16,800	84,000	.024500	.002150			
17,200	86,000	.027000	.002500			
17,600	88,000	.029500	.002500			
18,000	90,000	.032150	.002650			
18,400	92,000	.085750	.003600			
18,800	94,000	.039500	.003750			
19,200	96,000	.044250	.004750			
19,600	98,000	.048500	.004250			
20,000	100,000	.055500	.007000			
20,400	102,000	.0600	.0045			
20,800	104,000	.0800	.0200			
21,000	105,000	.1100	.0300			Tensile strength.

General summary.

Tensile strength per square inch of original section........pounds.. 105,000
Elastic limit per square inch of original section........do ... 59,000
Elongation per inch after rupture........inch.. 0.2000
Elongation per inch under strain at elastic limit........do.... .001950
Reduction in diameter at point of rupture........do.... .115
Reduction in area after rupture, per centum of original section........ 40.8
Position of rupture........1".10 from neck
Character of broken surface........silky
Elongation of inch sections........".14, ".26

No. 3272.

Marks, $^{32\ \mathrm{R}_{\mathrm{ss}}\ \mathrm{B\ C}}_{\mathrm{T}}$,
Diameter, ″.505.
Sectional area, .20 square inch.

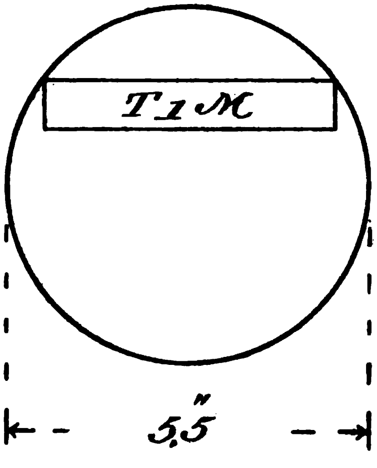
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000750	.000200	0.	....	
5,000	25,000	.000900	.000150	0.	....	
6,000	30,000	.001050	.000150	0.	....	
7,000	35,000	.001200	.000150	0.	....	
8,000	40,000	.001400	.000200	0.	....	
9,000	45,000	.001550	.000150	....	....	
10,000	50,000	.001750	.000200	....	....	
10,200	51,000	.001800	.000050	....	....	
10,400	52,000	.001800	0.	....	....	
10,600	53,000	.001850	.000050	....	....	
10,800	54,000	.001900	.000050	....	....	
11,000	55,000	.001950	.000050	....	....	
11,200	56,000	.001950	0.	....	....	
11,400	57,000	.002000	.000050	....	....	
11,600	58,000	.002050	.000050	....	....	
11,800	59,000	.002100	.000050	....	....	Elastic limit.
12,000	60,000	.002250	.000150	....	....	
12,200	61,000	.002750	.000500	....	....	
12,400	62,000	.004350	.001600	....	....	
12,800	64,000	.006350	.002000	....	....	
13,200	66,000	.008000	.001650	....	....	
13,600	68,000	.009500	.001500	....	....	
14,000	70,000	.011100	.001600	....	....	
14,400	72,000	.012850	.001750	....	....	
14,800	74,000	.014500	.001650	....	....	
15,200	76,000	.016350	.001850	....	....	
15,600	78,000	.018050	.001700	....	....	
16,000	80,000	.019850	.001800	....	....	
16,400	82,000	.022000	.002150	....	....	
16,800	84,000	.024000	.002000	....	....	
17,200	86,000	.026250	.002250	....	....	
17,600	88,000	.029400	.003150	....	....	
18,000	90,000	.031850	.002450	....	....	
18,400	92,000	.034400	.002550	....	....	
18,800	94,000	.038100	.003700	....	....	
19,200	96,000	.042000	.003900	....	....	
19,600	98,000	.047250	.005250	....	....	
20,000	100,000	.051900	.004650	....	....	
20,400	102,000	.0575	.0056	....	....	
20,800	104,000	.0700	.0125	....	....	
21,200	106,000	.0950	.0250	....	....	
21,280	106,400	.1100	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 106,400
Elastic limit per square inch of original section..............................do.... 59,000
Elongation per inch after rupture..............................inch.. 0.1950
Elongation per inch under strain at elastic limit..............................do.... .002100
Reduction in diameter at point of rupture..............................do.... .095
Reduction in area after rupture, per centum of original section.............................. 84.0
Position of rupture..............................1″ from neck
Character of broken surface, silky, 50 per cent.; granular, 50 per cent. A seam extends across the middle of the fractured surface.
Elongation of inch sections..............................″.20*, ″.19*

3.2 inch steel B. L. Rifles

Gas check cups



H Ex No 16 50, 1.

No. 3278.

Marks, $\overset{32\,\mathrm{R_{88}}\,\mathrm{G\,C}}{\mathrm{T,\,M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001100	.000100	0.	....	
8,000	40,000	.001350	.000250	0.	....	
9,000	45,000	.001550	.000200	....	....	
10,000	50,000	.001700	.000150	....	....	
11,000	55,000	.001900	.000200	....	....	
12,000	60,000	.002100	.000200	....	....	
12,200	61,000	.002150	.000050	....	....	
12,400	62,000	.002150	0.	....	....	
12,600	63,000	.002200	.000050	....	....	
12,800	64,000	.002250	.000050	....	....	
13,000	65,000	.002300	.000050	....	....	
13,200	66,000	.002350	.000050	....	....	
13,400	67,000	.002400	.000050	....	....	
13,600	68,000	.002450	.000050	....	....	
13,800	69,000	.002500	.000050	....	....	
14,000	70,000	.002550	.000050	....	....	
14,200	71,000	.002600	.000050	....	....	
14,400	72,000	.002650	.000050	....	....	
14,600	73,000	.002650	0.	....	....	
14,800	74,000	.002700	.000050	....	....	
15,000	75,000	.002750	.000050	....	....	Elastic limit.
15,200	76,000	.002850	.000100	....	....	
15,400	77,000	.002950	.000100	....	....	
15,600	78,000	.003100	.000150	....	....	
15,800	79,000	.003300	.000200	....	....	
16,000	80,000	.003600	.000300	....	....	
16,200	81,000	.003900	.000300	....	....	
16,400	82,000	.004300	.000400	....	....	
16,800	84,000	.005250	.000950	....	....	
17,200	86,000	.007200	.001950	....	....	
17,600	88,000	.008050	.000850	....	....	
18,000	90,000	.009350	.001300	....	....	
18,400	92,000	.010750	.001400	....	....	
18,800	94,000	.012100	.001350	....	....	
19,200	96,000	.013350	.001250	....	....	
19,600	98,000	.014850	.001500	....	....	
20,000	100,000	.016400	.001550	....	....	
20,400	102,000	.017900	.001500	....	....	
20,800	104,000	.019750	.001850	....	....	
21,200	106,000	.021550	.001800	....	....	
21,600	108,000	.023000	.001450	....	....	
22,000	110,000	.024750	.001750	....	....	
22,400	112,000	.026500	.001750	....	....	
22,800	114,000	.028600	.002100	....	....	
23,200	116,000	.030850	.002250	....	....	
23,600	118,000	.033000	.002150	....	....	
24,000	120,000	.036200	.003200	....	....	
24,800	124,000	.042500	.006300	....	....	
25,600	128,000	.0500	.0075	....	....	
26,400	132,000	.0600	.0100	....	....	
26,700	133,500	.1050	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	133,500
Elastic limit per square inch of original section	do ...	75,000
Elongation per inch after rupture	inch..	0.1050
Elongation per inch under strain at elastic limit	do....	.002750
Reduction in diameter at point of rupture	do....	.035
Reduction in area after rupture, per centum of original section		13.2
Position of rupture		".40 from neck
Character of broken surface		granular; line of flaky metal across middle
Elongation of inch sections		".11*, ".10

No. 3279.

Marks, $^{32}\frac{\text{R, G C}}{\text{T, M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001400	.000150	0.	....	
10,000	50,000	.001550	.000150	0.	....	
11,000	55,000	.001750	.000200	....	....	
12,000	60,000	.001950	.000200	....	....	
12,200	61,000	.002000	.000050	....	....	
12,400	62,000	.002050	.000050	....	....	
12,600	63,000	.002100	.000050	....	....	
12,800	64,000	.002150	.000050	....	....	
13,000	65,000	.002200	.000050	....	....	
13,200	66,000	.002200	0.	....	....	
13,400	67,000	.002250	.000050	....	....	
13,600	68,000	.002300	.000050	....	....	
13,800	69,000	.002300	0.	....	....	
14,000	70,000	.002350	.000050	....	....	
14,200	71,000	.002400	.000050	....	....	
14,400	72,000	.002400	0.	....	....	
14,600	73,000	.002450	.000050	....	....	
14,800	74,000	.002500	.000050	....	....	
15,000	75,000	.002550	.000050	....	....	
15,200	76,000	.002600	.000050	....	....	Elastic limit.
15,400	77,000	.002700	.000100	....	....	
15,600	78,000	.002900	.000200	....	....	
15,800	79,000	.003150	.000250	....	....	
16,000	80,000	.003450	.000300	....	....	
16,400	82,000	.004700	.001250	....	....	
16,800	84,000	.005950	.001250	....	....	
17,200	86,000	.007100	.001150	....	....	
17,600	88,000	.008400	.001300	....	....	
18,000	90,000	.009850	.001450	....	....	
18,400	92,000	.011100	.001250	....	....	
18,800	94,000	.012400	.001300	....	....	
19,200	96,000	.013650	.001250	....	....	
19,600	98,000	.015200	.001550	....	....	
20,000	100,000	.016750	.001550	....	....	
20,400	102,000	.018400	.001650	....	....	
20,800	104,000	.020100	.001700	....	....	
21,200	106,000	.021750	.001650	....	....	
21,600	108,000	.023400	.001650	....	....	
22,000	110,000	.025050	.001650	....	....	
22,400	112,000	.027100	.002050	....	....	
22,800	114,000	.029250	.002150	....	....	
23,200	116,000	.031600	.002350	....	....	
23,600	118,000	.034200	.002600	....	....	
24,000	120,000	.037100	.002900	....	....	
24,800	124,000	.0450	.0079	....	....	
25,600	128,000	.0525	.0075	....	....	
26,380	131,900	.0800	.0275	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 131,900
Elastic limit per square inch of original section..........do.... 76,000
Elongation per inch after rupture..........inch.. 0.1000
Elong tion per inch under strain at elastic limit..........do.... .002600
Reduction in diameter at point of rupture..........do.... .045
Reduction in area after rupture, per centum of original section.......... 16.9
Position of rupture.........."·.55 from neck
Character of broken surface..........granular; radiating from a dull spot at the circumference
Diameter ½" from point of rupture.........."·.45
Elongation of inch sections.........."·.14*, "·.06

No. 3280.

Marks, $^{32\,\text{B}_{m}\,\text{G C}}_{\quad\text{T}_1\,\text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001300	.000200	0.	....	
9,000	45,000	.001500	.000200	0.	....	
10,000	50,000	.001650	.000150	0.	....	
11,000	55,000	.001800	.000150	....	....	
12,000	60,000	.002000	.000200	....	....	
12,200	61,000	.002050	.000050	....	....	
12,400	62,000	.002100	.000050	....	....	
12,600	63,000	.002200	.000100	....	....	
12,800	64,000	.002250	.000050	....	....	
13,000	65,000	.002250	0.	....	....	
13,200	66,000	.002300	.000050	....	....	
13,400	67,000	.002350	.000050	....	....	
13,600	68,000	.002400	.000050	....	....	
13,800	69,000	.002450	.000050	....	....	
14,000	70,000	.002500	.000050	....	....	
14,200	71,000	.002550	.000050	....	....	
14,400	72,000	.002550	0.	....	....	
14,600	73,000	.002600	.000050	....	....	
14,800	74,000	.002600	0.	....	....	Elastic limit.
15,000	75,000	.002700	.000100	....	....	
15,200	76,000	.002800	.000100	....	....	
15,400	77,000	.002950	.000150	....	....	
15,600	78,000	.003150	.000200	....	....	
15,800	79,000	.003350	.000200	....	....	
16,000	80,000	.003650	.000300	....	....	
16,400	82,000	.004500	.000850	....	....	
16,800	84,000	.005600	.001100	....	....	
17,200	86,000	.006600	.001000	....	....	
17,600	88,000	.007850	.001250	....	....	
18,000	90,000	.009150	.001300	....	....	
18,400	92,000	.010600	.001450	....	....	
18,800	94,000	.011850	.001250	....	....	
19,200	96,000	.013200	.001350	....	....	
19,600	98,000	.014500	.001300	....	....	
20,000	100,000	.016050	.001550	....	....	
20,400	102,000	.017500	.001450	....	....	
20,800	104,000	.019050	.001550	....	....	
21,200	106,000	.021000	.001950	....	....	
21,600	108,000	.022850	.001850	....	....	
22,000	110,000	.024500	.001650	....	....	
22,400	112,000	.026450	.001950	....	....	
22,800	114,000	.028500	.002050	....	....	
23,200	116,000	.030600	.002100	....	....	
23,600	118,000	.033000	.002400	....	....	
24,000	120,000	.035650	.002650	....	....	
24,800	124,000	.0400	.004350	....	....	
25,600	128,000	.0500	.0100	....	....	
26,400	132,000	.0650	.0150	....	....	
26,500	132,500	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	132,500
Elastic limit per square inch of original section	do....	74,000
Elongation per inch after rupture	inch..	0.0700
Elongation per inch under strain at elastic limit	do....	.002600
Reduction in diameter at point of rupture	do....	.025
Reduction in area after rupture, per centum of original section		9.5
Position of rupture		″.95 from neck
Character of broken surface		granular
Elongation of inch sections		″.08, ″.06

No. 3281.

Marks, $^{82\ R_{40}\ G\ C}_{T_1\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	0.	....	
9,000	45,000	.001450	.000200	0.	....	
10,000	50,000	.001650	.000200	0.	....	
11,000	55,000	.001800	.000150	....	....	
12,000	60,000	.001950	.000150	....	....	
13,000	65,000	.002150	.000200	....	....	
13,200	66,000	.002200	.000050	....	....	
13,400	67,000	.002200	0.	....	....	
13,600	68,000	.002250	.000050	....	....	
13,800	69,000	.002300	.000050	....	....	
14,000	70,000	.002350	.000050	....	....	
14,200	71,000	.002400	.000050	....	....	
14,400	72,000	.002450	.000050	....	....	
14,600	73,000	.002500	.000050	....	....	
14,800	74,000	.002550	.000050	....	....	
15,000	75,000	.002600	.000050	....	....	
15,200	76,000	.002650	.000050	....	....	Elastic limit.
15,400	77,000	.002750	.000100	....	....	
15,600	78,000	.002950	.000200	....	....	
15,800	79,000	.003150	.000200	....	....	
16,000	80,000	.003450	.000300	....	....	
16,400	82,000	.004150	.000700	....	....	
16,800	84,000	.005250	.001100	....	....	
17,200	86,000	.006750	.001500	....	....	
17,600	88,000	.008100	.001350	....	....	
18,000	90,000	.009550	.001450	....	....	
18,400	92,000	.010650	.001100	....	....	
18,800	94,000	.012100	.001450	....	....	
19,200	96,000	.013600	.001500	....	....	
19,600	98,000	.015050	.001450	....	....	
20,000	100,000	.016750	.001700	....	....	
20,400	102,000	.018100	.001350	....	....	
20,800	104,000	.019750	.001650	....	....	
21,200	106,000	.021600	.001850	....	....	
21,600	108,000	.023500	.001900	....	....	
22,000	110,000	.024900	.001400	....	....	
22,400	112,000	.026350	.001450	....	....	
22,800	114,000	.028600	.002250	....	....	
23,200	116,000	.030850	.002250	....	....	
23,600	118,000	.033500	.002650	....	....	
24,000	120,000	.036250	.002750	....	....	
24,800	124,000	.0425	.006250	....	....	
25,600	128,000	.0525	.0100	....	....	
26,400	132,000	.0700	.0175	....	....	
26,550	132,750	.0950	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	132,750
Elastic limit per square inch of original section	do	76,000
Elongation per inch after rupture	inch	0.1200
Elongation per inch under strain at elastic limit	do	.002650
Reduction in diameter at point of rupture	do	.045
Reduction in area after rupture, per centum of original section		16.9
Position of rupture		″.80 from neck
Character of broken surface		granular; flaky spot at the circumference
Elongation of inch sections		″.16*, ″.08

No. 3282.

Marks, $^{32}\begin{smallmatrix}\text{R}_s\text{ G C}\\ \text{T}_1\text{ M}\end{smallmatrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001050	.000150	0.	....	
8,000	40,000	.001250	.000200	0.	....	
9,000	45,000	.001400	.000150	0.	....	
10,000	50,000	.001550	.000150	0.	....	
11,000	55,000	.001700	.000150	....	....	
12,000	60,000	.001900	.000200	....	....	
13,000	65,000	.002050	.000150	....	....	
14,000	70,000	.002250	.000200	....	....	
14,200	71,000	.002300	.000050	....	....	Elastic limit.
14,400	72,000	.002400	.000100	....	....	
14,600	73,000	.002600	.000200	....	....	
14,800	74,000	.002800	.000200	....	....	
15,000	75,000	.003100	.000300	....	....	
15,200	76,000	.003400	.000300	....	....	
15,400	77,000	.003750	.000350	....	....	
15,600	78,000	.004100	.000350	....	....	
16,000	80,000	.005350	.001250	....	....	
16,400	82,000	.006500	.001150	....	....	
16,800	84,000	.007650	.001150	....	....	
17,200	86,000	.008900	.001250	....	....	
17,600	88,000	.010100	.001200	....	....	
18,000	90,000	.011500	.001400	....	....	
18,400	92,000	.012600	.001100	....	....	
18,800	94,000	.014000	.001400	....	....	
19,200	96,000	.015550	.001550	....	....	
19,600	98,000	.016750	.001200	....	....	
20,000	100,000	.018250	.001500	....	....	
20,400	102,000	.019800	.001550	....	....	
20,800	104,000	.021500	.001700	....	....	
21,200	106,000	.022800	.001300	....	....	
21,600	108,000	.024550	.001750	....	....	
22,000	110,000	.026500	.001950	....	....	
22,400	112,000	.028850	.002350	....	....	
22,800	114,000	.031050	.002200	....	....	
23,200	116,000	.033250	.002200	....	....	
23,600	118,000	.035950	.002700	....	....	
24,000	120,000	.038500	.002550	....	....	
24,800	124,000	.0450	.0065	....	....	
25,600	128,000	.0550	.0100	....	....	
26,280	131,400	.0850	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	131,400
Elastic limit per square inch of original section	do....	71,000
Elongation per inch after rupture	inch..	0.1150
Elongation per inch under strain at elastic limit	do....	.002300
Reduction in diameter at point of rupture	do....	.055
Reduction in area after rupture, per centum of original section		20.5
Position of rupture		″.72 from neck
Character of broken surface		granular; flaky spot near center
Elongation of inch sections		″.07, ″.16*

No. 3322.

Marks, $\overset{32\ R_x\ D}{T_1\ M}$
Diameter, ".505
Sectional area, .20 square inch.

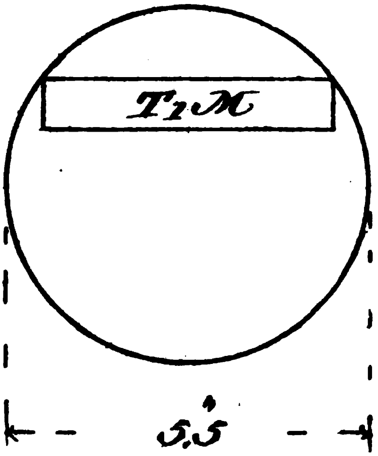
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000400	.000100	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001100	.000200	....	....	
8,000	40,000	.001250	.000150	....	....	
9,000	45,000	.001400	.000150	....	....	
10,000	50,000	.001600	.000200	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001650	0.	....	....	
10,600	53,000	.001700	.000050	....	....	
10,800	54,000	.001750	.000050	....	....	
11,000	55,000	.001800	.000050	....	....	
11,200	56,000	.001850	.000050	....	....	
11,400	57,000	.001850	0.	....	....	
11,600	58,000	.001900	.000050	....	....	Elastic limit.
11,800	59,000	.019350	.017450	....	....	
12,000	60,000	.020250	.000900	....	....	
12,400	62,000	.022050	.001800	....	....	
12,800	64,000	.024350	.001300	....	....	
13,200	66,000	.026750	.002400	....	....	
13,600	68,000	.029500	.002750	....	....	
14,000	70,000	.033750	.004250	....	....	
14,400	72,000	.037000	.003250	....	....	
14,800	74,000	.040500	.003500	....	....	
15,200	76,000	.044500	.004000	....	....	
15,600	78,000	.049000	.004500	....	....	
16,000	80,000	.056000	.007000	....	....	
16,400	82,000	.062750	.006750	....	....	
16,800	84,000	.0700	.007250	....	....	
17,200	86,000	.0850	.0150	....	....	
17,600	88,000	.1000	.0150	....	....	
18,000	90,000	.1350	.0350	....	....	
18,080	90,400	.1650	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	90,400
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.2450
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".40 from neck
Character of broken surface		silky
Elongation of inch sections		".14, ".35

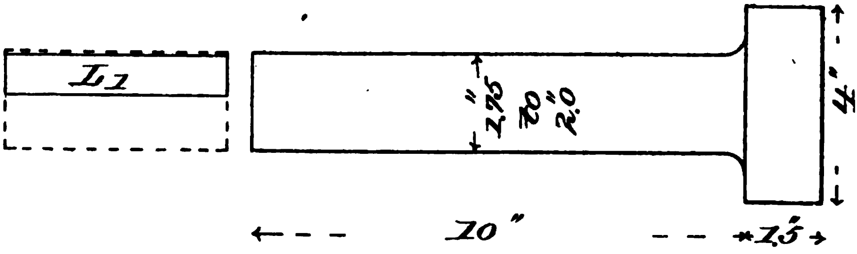
3.2 inch steel B. L. Rifles

Discs for breech mechanism



3.2 inch steel B.L. Rifles

Spindles



No. 735.

Marks, $^{32}R_{12}$ S P L_1
Length, 4″.501.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40,000	.001267	.000167	0.	....	
22,500	45,000	.001433	.000166	....	....	
25,000	50,000	.001600	.000167	....	....	
27.500	55,000	.001767	.000167	....	....	
30,000	60,000	.001933	.000166	....	....	
30,500	61,000	.001967	.000034	....	....	
31,000	62,000	.002000	.000033	....	....	
31,500	63,000	.002033	.000033	....	....	
32,000	64,000	.002100	.000067	....	....	Elastic limit.
32,500	65,000	.002333	.000233	....	....	
33,000	66,000	.002933	.000600	....	....	
33,500	67.000	.003833	.000900	....	....	
34,000	68,000	.004633	.000800	....	....	
34,500	69,000	.005500	.000867	....	....	
35,000	70,000	.006500	.001600	....	....	
54,010	108,020	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 736.

Marks, $^{32\,R_p x S P}_{\quad L_1}$
Length, 4."05.
Diameter, ".798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000200	.000133	0.	....	
7,500	15,000	.000333	.000133	0.	....	
10,000	20,000	.000500	.000167	0.	....	
12,500	25,000	.000667	.000167	0.	....	
15,000	30,000	.000833	.000166	0.	....	
17,500	35,000	.001000	.000167	0.	....	
20,000	40,000	.001167	.000167	0.	....	
22,500	45,000	.001333	.000166	....	....	
25,000	50,000	.001500	.000167	....	....	
27,500	55,000	.001633	.000133	....	....	
30,000	60,000	.001800	.000167	....	....	
30,500	61,000	.001833	.000033	....	....	
31,000	62,000	.001867	.000034	....	....	
31,500	63,000	.001933	.000066	....	....	
32,000	64,000	.001967	.000034	....	....	
32,500	65,000	.002000	.000033	....	....	Elastic limit.
33,000	66,000	.002233	.000233	....	....	
33,500	67,000	.002567	.000334	....	....	
34,000	68,000	.005167	.002600	....	....	
34,500	69,000	.006100	.000933	....	....	
35,000	70,000	.007167	.001067	....	....	
56,050	112,100	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 732.

Marks, $\overset{32\ R_{28}\ S\ P}{L_1}$
Length, 4″.47.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000400	.000133	0.	....	
10,000	20,000	.000567	.000167	0.	....	
12,500	25,000	.000733	.000166	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001067	.000167	0.	....	
20,000	40,000	.001200	.000133	0.	....	
22,500	45,000	.001367	.000167	....	....	
25,000	50,000	.001533	.000166	....	....	
27,500	55,000	.001667	.000134	....	....	
30,000	60,000	.001800	.000133	....	....	
30,500	61,000	.001833	.000033	....	....	
31,000	62,000	.001867	.000034	....	....	Elastic limit.
31,500	63,000	.001967	.000100	....	....	
32,000	64,000	.002133	.000166	....	....	
32,500	65,000	.002400	.000267	....	....	
33,000	66,000	.003067	.000667	....	....	
33,500	67,000	.003733	.000666	....	....	
34,000	68,000	.004600	.000867	....	....	
34,500	69,000	.005500	.000900	....	....	
35,000	70,000	.006600	.001100	....	....	
53,190	106,380	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 733.

Marks, $^{82\ \mathrm{R_{ss}}\ \mathrm{S\ P}}_{\mathrm{L}}$
Length, 4''.50.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40,000	.001233	.000133	.000033	.000033	
22,500	45,000	.001400	.000167	....	....	
25,000	50,000	.001533	.000133	....	....	
27,500	55,000	.001700	.000167	....	....	
30,000	60,000	.001833	.000133	....	....	
30,500	61,000	.001900	.000067	....	....	
31,000	62,000	.001933	.000033	....	....	
31,500	63,000	.001933	0.	....	....	
32,000	64,000	.002000	.000067	....	....	
32,500	65,000	.002000	0.	....	....	
30,000	66,000	.002033	.000033	....	....	
33,500	67,000	.002033	0.	....	....	
34,000	68,000	.002100	.000067	....	....	Elastic limit.
34,500	69,000	.004500	.002400	....	....	
35,000	70,000	.005333	.000833	....	....	
35,500	71,000	.006167	.000834	....	....	
36,000	72,000	.007500	.001333	....	....	
54,190	108,380	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 734.

Marks, $\genfrac{}{}{0pt}{}{32\ R_{36}\ S\ P}{L_1}$
Length, 4″.5.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000233	.000166	0.	....	
7,500	15,000	.000400	.000167	0.	....	
10,000	20,000	.000533	.000133	0.	....	
12,500	25,000	.000700	.000167	0.	....	
15,000	30,000	.000867	.000167	0.	....	
17,500	35,000	.001033	.000166	0.	....	
20,000	40,000	.001200	.000167	0.	....	
22,500	45,000	.001367	.000167	....	....	
25,000	50,000	.001533	.000166	....	....	
27,500	55,000	.001700	.000167	....	....	
30,000	60,000	.001867	.000167	....	....	
30,500	61,000	.001900	.000033	....	....	
31,000	62,000	.001933	.000033	....	....	
31,500	63,000	.002000	.000067	....	....	
32,000	64,000	.002033	.000033	....	....	
32,500	65,000	.002100	.000067	....	....	Elastic limit.
33,000	66,000	.002233	.000133	....	....	
33,500	67,000	.002500	.000267	....	....	
34,000	68,000	.003000	.000500	....	....	
34,500	69,000	.003333	.000333	....	....	
35,000	70,000	.004000	.000667	....	....	
35,500	71,000	.004600	.000600	....	....	
36,000	72,000	.005333	.000733	....	....	
54,700	109,400	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 737.

Marks, $^{32\ R_{44}\ S\ P}_{L_1}$
Length, 4″.05.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000567	.000134	0.	....	
12,500	25,000	.000733	.000166	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001067	.000167	0.	....	
20,000	40,000	.001233	.000166	0.	....	
22,500	45,000	.001367	.000134	....	....	
25,000	50,000	.001500	.000133	....	....	
27,500	55,000	.001667	.000167	....	....	
30,000	60,000	.001767	.000100	....	....	
30,500	61,000	.001800	.000033	....	....	
31,000	62,000	.001833	.000033	....	....	
31,500	63,000	.001833	0.	....	....	
32,000	64,000	.001800	.000033	....	....	Elastic limit.
32,500	65,000	.002100	.000300	....	....	
33,000	66,000	.004333	.002233	....	....	
33,500	67,000	.006100	.001767	....	....	
34,000	68,000	.007000	.000900	....	....	
56,100	112,200	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 738.

Marks, $^{22\,\mathrm{R_{ea}}\,\mathrm{S\,P}}_{\mathrm{L_1}}$
Length, 4″.05.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000200	.000133	0.	....	
7,500	15,000	.000300	.000100	0.	....	
10,000	20,000	.000433	.000133	0.	....	
12,500	25,000	.000600	.000167	0.	....	
15,000	30,000	.000767	.000167	0.	....	
17,500	35,000	.000900	.000133	0.	....	
20,000	40,000	.001067	.000167	0.	....	
22,500	45,000	.001267	.000200	....	....	
25,000	50,000	.001433	.000166	....	....	
27,500	55,000	.001633	.000200	....	....	
30,000	60,000	.001833	.000200	....	....	Elastic limit not well defined.
30,500	61,000	.001933	.000100	....	....	
31,000	62,000	.002000	.000067	....	....	
31,500	63,000	.002100	.000100	....	....	
32,000	64,000	.002200	.000100	....	....	
32,500	65,000	.002967	.000767	....	....	
33,000	66,000	.004433	.001466	....	....	
33,500	67,000	.005633	.001200	....	....	
34,000	68,000	.006333	.000700	....	....	
56,480	112,960	....	....	....	....	Ultimate strength.

Failed by triple flexure.

TABULATION OF SPECIMENS FROM TUBES FOR 3″.2 STEEL B. L. RIFLES.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 2 inches.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*				
3466	Breech, No. 29	Middle	51,000	91,650	24.5	43.3	Silky			
3467	Breech, No. 29	do	49,000	90,850	24.0	46.2	do			
3468	Muzzle, No. 29	do	51,000	94,450	24.0	43.8	do			
3469	Muzzle, No. 29	do	50,000	93,750	24.5	43.8	do			
3451	Breech, No. 32	do	52,000	93,000	21.0	46.2	do			
3452	Breech, No. 32	do	50,000	92,000	23.0	43.8	do			
3453	Muzzle, No. 32	do	45,000	87,550	23.5	49.1	do			
3454	Muzzle, No. 32	do	47,000	87,550	23.5	46.2	do			
3480	Breech, No. 33	do	51,000	87,550	22.5	51.9	do			
3481	Breech, No. 33	do	50,000	88,450	23.5	46.2	do			
3482	Muzzle, No. 33	do	48,000	86,000	25.5	46.2	do			
3483	Muzzle, No. 33	do	47,000	86,700	27.0	43.3	do			
3349	Breech, No. 42	do	50,000	87,500	23.0	43.8	do			
3350	Breech, No. 42	do	50,000	85,700	24.0	49.1	do			
3351	Muzzle, No. 42	do	47,000	81,600	23.5	54.6	do			
3352	Muzzle, No. 42	do	49,000	84,450	15.0	27.4	Granular, flaky spot			
3464	Muzzle, No. 42	do	46,000	81,000	20.5	51.9	Silky			Additional specimen.
3465	Muzzle, No. 42	do	49,000	86,000	15.5	27.4	Granular, 50 per cent.; silky, 50 per cent.			Do.
3287	Breech, No. 43	do	49,000	84,700	25.5	46.2	Silky			
3288	Breech, No. 43	do	48,000	82,600	18.5	49.1	do			
3289	Muzzle, No. 43	do	45,000	86,450	20.5	34.0	Silky, 50 per cent.; granular, 50 per cent			
3290	Muzzle, No. 43	do	44,000	85,750	21.5	40.8	Silky			
3295	Breech, No. 44	do	48,000	79,600	26.0	46.2	do			
3296	Breech, No. 44	do	46,000	81,950	24.0	46.2	do			
3297	Muzzle, No. 44	do	47,000	85,250	23.0	46.2	do			
3298	Muzzle, No. 44	do	45,000	86,850	24.0	46.2	do			
3455	Breech, No. 45	do	51,000	90,400	21.0	46.2	do			
3456	Breech, No. 45	do	52,000	92,400	21.5	46.2	do			
3457	Muzzle, No. 45	do	48,000	88,450	24.5	43.8	do			
3458	Muzzle, No. 45	do	49,000	90,000	18.5	37.1	Silky, trace of granulation			
3386	Breech, No. 47	do	48,000	88,350	21.0	43.8	Silky			
3387	Breech, No. 47	do	46,000	87,000	25.5	43.3	do			
3388	Muzzle, No. 47	do	48,000	90,800	23.5	40.3	Silky, 60 per cent.; granular, 40 per cent.			
3389	Muzzle, No. 47	do	50,000	91,400	23.0	40.3	Silky			
3291	Breech, No. 48	do	48,000	81,500	28.5	46.2	do			
3292	Breech, No. 48	do	48,000	85,950	24.5	43.3	do			
3293	Muzzle, No. 48	do	46,000	86,900	21.0	40.3	Silky, partly granular			
3294	Muzzle, No. 48	do	48,000	88,900	23.0	46.2	Silky			
3299	Breech, No. 50	do	44,000	86,200	22.5	40.8	do			
3300	Breech, No. 50	do	45,000	85,000	25.0	40.3	do			

3301	Muzzle, No. 50	do	54,000	92,300	17.5	43.3	do			
3302	Muzzle, No. 50	do	51,000	89,150	21.0	40.3	do			
3462	Muzzle, No. 50	do	50,000	89,450	19.5	43.3	do			Additional specimen.
3463	Muzzle, No. 50	do	49,000	85,350	23.5	40.3	do			

TABULATION OF SPECIMENS FROM JACKETS FOR 3".2 STEEL B. L. RIFLES.

3244	End, No. 26	Middle	50,000	93,850	16.5	27.4	Granular, silky spot			
3245	End, No. 26	do	49,000	93,950	15.5	20.5	Granular, dull spot			
3257	End, No. 27	do	51,000	102,400	15.0	23.9	do			
3258	End, No. 27	do	56,000	101,000	15.0	23.9	do			
3476	End, No. 27	do	53,000	99,550	15.5	16.9	do			Additional specimen.
3477	End, No. 27	do	55,000	102,900	22.0	23.9	Granular, dull flaky line			Do.
3246	End, No. 28	do	49,000	102,000	19.0	34.0	Silky, 60 per cent.; granular, 40 per cent.			
3247	End, No. 28	do	52,000	106,900	16.0	27.4	Granular, 60 per cent.; silky, 40 per cent.			
3259	End, No. 29	do	51,000	104,100	18.0	34.0	Granular, 50 per cent.; silky, 50 per cent.			
3260	End, No. 29	do	53,000	107,950	17.5	30.7	do			
3313	End, No. 30	do	48,000	94,300	20.0	20.5	Granular, dull spot			
3314	End, No. 30	do	49,000	95,900	18.5	30.7	Granular, silky spot			
3181	End, No. 31	do	53,000	100,850	19.5	23.9	do			
3182	End, No. 31	do	53,000	103,350	17.0	30.7	do			
3248	End, No. 32	do	55,000	103,800	14.5	23.9	Granular, dull flaky spot			
3249	End, No. 32	do	54,000	102,350	16.0	37.1	Granular, silky spot			
3250	End, No. 33	do	54,000	101,900	18.5	30.7	Granular, silky center			
3251	End, No. 33	do	52,000	100,950	10.5	18.2	Granular, flaky spot			
3183	End, No. 34	do	54,000	104,450	16.0	34.0	Granular, 60 per cent; silky, 40 per cent.			
3184	End, No. 34	do	52,000	99,300	23.0	40.3	Silky, trace of granulation			
3185	End, No. 35	do	51,000	104,000	18.0	34.0	Granular, 60 per cent.; silky, 40 per cent.			
3186	End, No. 35	do	52,000	102,300	17.0	23.9	Granular, dull spot			
3307	End, No. 36	do	49,000	93,350	21.5	43.3	Silky			
3308	End, No. 36	do	50,000	89,300	24.0	49.1	do			
3309	End, No. 37	do	54,000	98,450	18.5	27.4	Granular, silky spot			
3310	End, No. 37	do	50,000	95,450	20.0	30.7	do			
3167	End, No. 38	do	52,000	101,500	21.0	37.1	Silky, 70 per cent.; granular, 30 per cent			
3168	End, No. 38	do	55,000	103,550	16.5	34.0	Silky, 60 per cent.; granular, 40 per cent.			
3484	End, No. 38	do	53,000	93,100	25.0	49.1	Silky			
3485	End, No. 38	do	54,000	94,300	24.0	46.2	do			
3169	End, No. 39	do	54,000	99,700	20.0	34.0	Granular, 60 per cent.; silky, 40 per cent.			
3170	End, No. 39	do	52,000	101,850	19.0	37.1	Granular, 50 per cent.; silky, 50 per cent.			
3305	End, No. 41	do	50,000	97,050	21.5	37.1	Granular, silky center			
3306	End, No. 41	do	49,000	96,200	21.0	40.3	Silky, trace of granulation			
3478	End, No. 42	do	47,000	93,500	15.5	27.4	Silky, 50 per cent.; granular, 50 per cent			
3479	End, No. 42	do	44,000	89,800	23.5	43.3	Silky			
3324	End, No. 43	do	49,000	100,050	19.0	37.1	Silky and granular			
3325	End, No. 43	do	52,000	104,750	20.5	34.0	Silky, 60 per cent.; granular, 40 per cent.			
3326	End, No. 44	do	46,000	91,350	20.0	40.3	Silky			
3327	End, No. 44	do	51,000	95,600	15.0	20.5	Granular, flaky spot			
3339	End, No. 45	do	50,000	94,800	21.0	46.2	Silky			

TABULATION OF SPECIMENS FROM JACKETS FOR 3".2 STEEL B. L. RIFLES.—Continued.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 2 inches.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*				
3340	End, No. 45	Middle	50,000	92,600	24.0	46.2	Silky			
3472	End, No. 46	do	48,000	92,600	24.0	46.2	do			
3473	End, No. 46	do	46,000	89,250	25.0	46.2	do			
3474	End, No. 47	do	47,000	89,050	24.5	49.1	do			
3475	End, No. 47	do	49,000	93,800	21.5	43.3	do			
3390	End, No. 48	do	49,000	94,400	25.5	43.8	do			
3391	End, No. 48	do	47,000	92,850	23.0	46.2	do			
3486	End, No. 49	do	49,000	90,400	20.0	34.0	Granular, silky spot			
3487	End, No. 49	do	50,000	93,000	24.5	43.3	Silky			
3488	End, No. 50	do	45,000	90,000	23.5	43.3	do			
3489	End, No. 50	do	44,000	89,200	23.0	43.3	do			

TABULATION OF SPECIMENS FROM TRUNNION HOOPS FOR 3".2 STEEL B. L. RIFLES.

3205	End, No. 21	Middle	54,000	97,300	18.5	30.7	Silky, in part granular			Second hoop.
3206	End, No. 21	do	53,000	95,850	20.0	37.1	Granular, 55 per cent.; silky, 45 per cent.			
3207	End, No. 21	do	52,000	96,400	17.0	30.7	Granular, 60 per cent.; silky, 40 per cent.			
3336	End, No. 26	do	52,000	93,800	24.0	49.1	Silky			
3337	End, No. 26	do	50,000	90,900	22.5	37.1	do			
3273	End, No. 27	do	54,000	97,600	24.0	49.1	do			
3274	End, No. 27	do	52,000	97,650	21.0	49.1	do			
3347	End, No. 30	do	48,000	89,450	18.0	30.7	Granular, flaky spot			
3348	End, No. 30	do	47,000	89,400	19.0	27.4	Granular, silky spot			
3317	End, No. 31	do	48,000	89,950	25.5	43.8	Silky			
3318	End, No. 31	do	48,000	91,150	26.0	46.2	do			
3319	End, No. 32	do	52,000	92,900	21.5	37.1	do			
3320	End, No. 32	do	52,000	93,600	25.5	40.3	do			
3275	End, No. 40	do	48,000	89,900	20.5	37.1	do			
3276	End, No. 40	do	51,000	94,050	24.5	40.2	do			
3341	End, No. 41	do	49,000	91,950	24.0	46.2	do			
3342	End, No. 41	do	46,000	90,200	22.5	43.3	do			
3343	End, No. 42	do	50,000	91,450	22.0	43.8	do			
3344	End, No. 42	do	49,000	91,800	20.5	40.8	do			
3345	End, No. 43	do	47,000	87,250	19.0	40.8	do			
3346	End, No. 43	do	48,000	89,350	23.5	46.2	do			
3315	End, No. 46	do	51,000	93,100	20.0	37.1	Silky, 60 per cent.; granular, 40 per cent.			
3316	End, No. 46	do	51,000	92,100	22.0	43.8	Silky			

TABULATION OF SPECIMENS FROM SLEEVES FOR 3".2 STEEL B. L. RIFLES.

3311	End, No. 26	Middle	53,000	89,600	21.5	49.1	Silky			
3470	End, No. 27	do	56,000	89,600	26.0	54.6	do			
3328	End, No. 28	do	50,000	88,050	25.5	54.6	Fine silky			
3434	End, No. 29	do	50,000	85,700	24.5	54.6	Silky			
3383	End, No. 30	do	54,000	94,100	24.5	49.1	do			
3329	End, No. 31	do	50,000	85,750	15.5	23.9	Silky; flaky			
3382	End, No. 31	do	51,000	86,200	24.0	46.2	do			Additional specimen.
3330	End, No. 32	do	52,000	88,600	20.5	37.0	Silky; lamellar			
3435	End, No. 33	do	52,000	91,350	20.0	34.0	Granular, 60 per cent.; silky, 40 per cent.			
3436	End, No. 34	do	54,000	92,550	22.5	43.3	Silky			
3384	End, No. 35	do	55,000	94,350	24.5	51.9	do			
3331	End, No. 36	do	53,000	91,500	25.0	51.9	Fine silky			
3312	End, No. 37	do	53,000	95,050	23.0	49.1	Silky			
3437	End, No. 38	do	51,000	90,200	27.0	54.6	do			
3252	End, No. 39	do	55,000	94,050	25.5	54.6	do			
3253	End, No. 40	do	52,000	91,800	23.0	46.2	do			
3254	End, No. 41	do	52,000	86,950	25.5	54.6	do			
3255	End, No. 42	do	49,000	89,300	25.0	51.9	do			
3256	End, No. 43	do	53,000	92,550	24.0	51.9	do			
3332	End, No. 44	do	54,000	90,300	25.0	23.9	Fine silky			
3353	End, No. 45	do	53,000	88,900	23.5	51.9	Silky			
3471	End, No. 46	do	50,000	86,000	26.5	57.2	do			
3438	End, No. 47	do	53,000	90,600	24.0	51.9	do			
3385	End, No. 48	do	46,000	83,600	25.0	46.2	do			
3439	End, No. 49	do	52,000	87,600	24.0	51.9	do			
3440	End, No. 50	do	51,000	91,900	23.5	51.9	do			

TABULATION OF SPECIMENS FROM BREECH BLOCKS FOR 3".2 STEEL B. L. RIFLES.

3283	End, No. 26	Middle	54,000	99,650	16.5	34.0	Granular; silky center			
3338	End, No. 33	do	56,000	102,700	15.5	30.7	do			
3323	End, No. 40	do	52,000	98,500	20.0	40.8	Silky			
3268	End, No. 46	do	54,000	99,800	20.0	34.0	Silky; trace of granulation			
3284	End, No. 50	do	52,000	96,600	19.5	40.3	Silky			

TABULATION OF SPECIMENS FROM BASE RINGS FOR 3".2 STEEL B. L. RIFLES.

3263	End, No. 26	Middle	53,000	96,400	21.5	46.2	Silky			
3264	End, No. 31	do	53,000	100,400	15.5	23.9	Granular; dull spot			
2365	End, No. 36	do	51,000	95,650	23.5	49.1	Silky			
3566	End, No. 41	do	50,000	94,230	24.0	43.3	do			
3267	Eud, No 46	do	48,000	89,200	26.5	46.2	do			

TABULATION OF SPECIMENS FROM KEY RINGS FOR 3".2 STEEL B. L. RIFLES.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 2 inches.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*				
3261	End, No. 26	Middle	52,000	96,100	24.0	46.2	Silky			
3277	End, No. 31	do	51,000	91,400	26.0	49.1	do			
3285	End, No. 36	do	46,000	85,600	25.0	40.3	do			
3286	End, No. 41	do	51,000	88,600	22.0	51.9	do			
3262	End, No. 46	do	51,000	92,400	21.5	49.1	do			

TABULATION OF SPECIMENS FROM BLOCK CARRIERS FOR 3".2 STEEL B. L. RIFLES.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 2 inches.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
3269	End, No. 26		50,000	93,550	22.5	51.9	Silky			
3270	End, No. 32		53,000	96,300	23.5	49.1	do			
3271	End, No. 36		59,000	105,000	20.0	40.3	do			
3272	End, No. 40		59,000	106,400	19.5	34.0	Silky, 50 per cent.; granular, 50 per cent			

TABULATION OF SPECIMENS FROM GAS CHECK-CUPS FOR 3".2 STEEL B. L. RIFLES.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 2 inches.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
3278	End, No. 26	Middle	75,000	133,500	10.5	13.2	Granular, line of flaky metal			
3279	End, No. 30	do	76,000	131,900	10.0	16.9	Granular, dull spot			
3280	End, No. 35	do	74,000	132,500	7.0	9.5	Granular			
3281	End, No. 40	do	76,000	132,750	12.0	16.9	Granular, flaky spot			
3282	End, No. 45	do	71,000	131,400	11.5	20.5	do			

TABULATION OF COMPRESSION SPECIMENS FROM SPINDLES FOR 3".2 STEEL B. L. RIFLES.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Pounds.	*Pounds.*		
735	End, No. 1. .	....	64,000	108,020	Triple flexure.....	Extra spindle.
736	End, No. 12 .	....	65,000	112,100	....do	Do.
732	End, No. 28 .	....	62,000	106,380	....do	
733	End, No. 32 .	....	68,000	108,380	... do	
734	End, No. 38 .	....	65,000	109,400	....do	
737	End, No. 44 .	....	64,000	112,200	....do	
738	End, No. 50 .	....	60,000	113,960	... do	

5-INCH STEEL B. L. RIFLE.—NEW JACKET.

Exterior diameter, 15″.5.
Interior diameter, 8″.5.

No. 2925.

Marks, $\overset{5\ B_1\ J}{B\ T_1\ I}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000450	.000100	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001200	.000250	0.	....	
8,000	40,000	.001350	.000150	0.	....	
8,200	41,000	.001400	.000050	....	....	
8,400	42,000	.001400	0.	....	....	
8,600	43,000	.001450	.000050	....	....	
8,800	44,000	.001500	.000050	....	....	
9,000	45,000	.001550	.000050	....	....	
9,200	46,000	.001600	.000050	....	....	
9,400	47,000	.001650	.000050	....	....	
9,000	48,000	.001750	.000100	....	....	
9,800	49,000	.001800	.000050	....	....	
10,000	50,000	.001800	0.	....	....	
10,200	51,000	.001850	0000050	....	....	
10,400	52,000	.001850	0.	....	....	
10,600	53,000	.001900	.000050	....	....	
10,800	54,000	.001900	0.	....	....	
11,000	55,000	.001950	.000050	....	....	
11,200	56,000	.002000	.000050	....	....	Elastic limit.
11,400	57,000	.002850	.000850	....	....	
11,600	58,000	.003800	.000950	....	....	
11,800	59,000	.004500	.000700	....	....	
12,000	60,000	.005300	.000800	....	....	
12,400	62,000	.006900	.001600	....	....	
12,800	64,000	.008750	.001850	....	....	
13,200	66,000	.010300	.001550	....	....	
13,000	68,000	.012000	.001700	....	....	
14,000	70,000	.013750	.001750	....	....	
14,400	72,000	.015550	.001800	....	....	
14,800	74,000	.018000	.002450	....	....	
15,200	76,000	.019900	.001900	....	....	
15,600	78,000	.022000	.002100	....	....	
16,000	80,000	.024000	.002000	....	....	
16,400	82,000	.026500	.002500	....	....	
16,800	84,000	.029100	.002600	....	....	
17,200	86,000	.032250	.003150	....	....	
17,600	88,000	.035500	.003250	....	....	
18,000	90,000	.039250	.003750	....	....	
18,400	92,000	.042000	.002750	....	....	
18,800	94,000	.048000	.006000	....	....	
19,200	96,000	.054000	.006000	....	....	
19,600	98,000	.0600	.0060	....	....	
20,000	100,000	.0700	.0100	....	....	
20,280	101,400	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	101,400
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.0650
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.025
Reduction in area after rupture, per centum of original section		9.5
Position of rupture		″.95 from neck
Character of broken surface		granular; radiating from a flaky spot at the circumference
Elongation of inch sections		″.09*, ″.08

No. 2926.

Marks, $\overset{5\ R_1\ J}{B\ T_5\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200	....	....	
2,000	10,000	.000350	.000150	....	....	
3,000	15,000	.000450	.000100	....	....	
4,000	20,000	.000600	.000150	....	....	
5,000	25,000	.000750	.000150	....	....	
6,000	30,000	.000900	.000150	....	....	
7,000	35,000	.001050	.000150	....	....	
8,000	40,000	.001250	.000200	....	....	
8,200	41,000	.001300	.000050	....	....	
8,400	42,000	.001300	0.	....	....	
8,600	43,000	.001350	.000050	....	....	
8,800	44,000	.001350	0.	....	....	Elastic limit.
9,000	45,000	.002350	.001000	....	....	
9,200	46,000	.003250	.000900	....	....	
9,400	47,000	.003850	.000600	....	....	
9,600	48,000	.004600	.000750	....	....	
9,800	49,000	.005300	.000700	....	....	
10,000	50,000	.006000	.000700	....	....	
10,400	52,000	.007400	.001400	....	....	
10,800	54,000	.009550	.002150	....	....	
11,200	56,000	.010600	.001050	....	....	
11,600	58,000	.012600	.002000	....	....	
12,000	60,000	.014300	.001700	....	....	
12,400	62,000	.015900	.001600	....	....	
12,800	64,000	.018050	.002150	....	....	
13,200	66,000	.020150	.002100	....	....	
13,600	68,000	.022250	.002100	....	....	
14,000	70,000	.024750	.002500	....	....	
14,400	72,000	.027500	.002750	....	....	
14,800	74,000	.029900	.002400	....	....	
15,200	76,000	.032900	.003000	....	....	
15,600	78,000	.036900	.004000	....	....	
16,000	80,000	.040150	.003250	....	....	
16,400	82,000	.044500	.004350	....	....	
16,800	84,000	.0500	.0055	....	....	
17,200	86,000	.0525	.0025	....	....	
17,600	88,000	.0600	.0075	....	....	
18,000	90,000	.0700	.0100	....	....	
18,400	92,000	.0900	.0200	....	....	
18,590	92,950	.1200	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	92,950
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.1900
Elongation per inch under strain at elastic limit	do	.001350
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		40.3
Position of rupture		″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.10, ″.28*

No. 720.

Marks, $\overset{5\ \text{B, J}}{\text{B T, M}}$
Length, 4″.502.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000333	.000333	0.	....	
5,000	10,000	.000533	.000200	0.	....	
7,500	15,000	.000733	.000200	0.	....	
10,000	20,000	.000900	.000167	0.	....	
12,500	25,000	.001067	.000167	0.	....	
15,000	30,000	.001233	.000166	0.	....	
17,500	35,000	.001467	.000134	0.	....	
20,000	40,000	.001667	.000200	.000067	.000067	
20,500	41,000	.001700	.000033	....	....	
21,000	42,000	.001733	.000033	....	....	Elastic limit.
21,500	43,000	.001800	.000067	....	....	
22,000	44,000	.002067	.000267	....	....	
22,500	45,000	.002700	.000433	....	....	
23,000	46,000	.004167	.001467	....	....	
23,500	47,000	.005000	.000833	....	....	
24,000	48,000	.005500	.000500	....	....	
24,500	49,000	.006233	.000733	....	....	
25,000	50,000	.006933	.000700	....	....	
46,180	92,360	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 3067.

Marks, $^{5\ R_1\ J}_{B\ T_{10}\ 1}$
Diameter, ".505.
Sectional area, ".20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001200	.000200	....	....	
8,000	40,000	.001350	.000150	....	....	
8,200	41,000	.001400	.000050	....	....	
8,400	42,000	.001450	.000050	....	....	
8,600	43,000	.001450	0.	....	....	
8,800	44,000	.001500	.000050	....	....	
9,000	45,000	.001550	.000050	....	....	
9,200	46,000	.001600	.000050	....	....	
9,400	47,000	.001650	.000050	....	....	
9,600	48,000	.001700	.000050	....	....	
9,800	49,000	.001750	.000050	....	....	
10,000	50,000	.001800	.000050	....	....	
10,200	51,000	.001850	.000050	....	....	
10,400	52,000	.001900	.000050	....	....	
10,600	53,000	.001950	.000050	....	....	
10,800	54,000	.002000	.000050	....	....	Elastic limit.
11,000	55,000	.002250	.000250	....	....	
11,200	56,000	.002600	.000350	....	....	
11,400	57,000	.003200	.000600	....	....	
11,600	58,000	.003850	.000650	....	....	
11,800	59,000	.004950	.001100	....	....	
12,000	60,000	.006100	.001150	....	....	
12,400	62,000	.007900	.001800	....	....	
12,800	64,000	.009850	.001950	....	....	
13,200	66,000	.011750	.001900	....	....	
13,600	68,000	.013650	.001900	....	....	
14,000	70,000	.015650	.002000	....	....	
14,400	72,000	.017600	.001950	....	....	
14,800	74,000	.020000	.002400	....	....	
15,200	76,000	.022250	.002250	....	....	
15,600	78,000	.024750	.002500	....	....	
16,000	80,000	.027300	.002550	....	....	
16,400	82,000	.030350	.003050	....	....	
16,800	84,000	.033500	.003150	....	....	
17,200	86,000	.037000	.003500	....	....	
17,600	88,000	.041500	.004500	....	....	
18,000	90,000	.046250	.004750	....	....	
18,400	92,000	.0500	.003750	....	....	
18,800	94,000	.0550	.0050	....	....	
19,200	96,000	.0650	.0100	....	....	
19,600	98,000	.0950	.0300	....	....	
19,720	98,600	.1100	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	98,600
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.2050
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.185
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		".90 from neck
Character of broken surface		silky
Elongation of inch sections		".13, ".25

No. 3068.

Marks, $^{5\ R_1\ J}_{B\ T_{11}\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	....	....	
8,000	40,000	.001350	.000200	....	....	
8,200	41,000	.001400	.000050	....	....	
8,400	42,000	.001450	.000050	....	....	
8,600	43,000	.001450	0.	....	....	
8,800	44,000	.001500	.000050	....	....	
9,000	45,000	.001500	0.	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001600	.000050	....	....	
9,600	48,000	.001600	0.	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	Elastic limit.
10,600	53,000	.001950	.000150	....	....	
10,800	54,000	.002250	.000300	....	....	
11,000	55,000	.002600	.000350	....	....	
11,200	56,000	.003350	.000750	....	....	
11,400	57,000	.004050	.000700	....	....	
11,600	58,000	.004750	.000700	....	....	
11,800	59,000	.005600	.000850	....	....	
12,000	60,000	.006750	.001150	....	....	
12,400	62,000	.008500	.001750	....	....	
12,800	64,000	.010150	.001650	....	....	
13,200	66,000	.012000	.001850	....	....	
13,600	68,000	.013600	.001600	....	....	
14,000	70,000	.015750	.002150	....	....	
14,400	72,000	.018250	.002500	....	....	
14,800	74,000	.020250	.002000	....	....	
15,200	76,000	.022000	.001750	....	....	
15,600	78,000	.024100	.002100	....	....	
16,000	80,000	.026900	.002800	....	....	
16,400	82,000	.029750	.002850	....	....	
16,800	84,000	.032750	.003000	....	....	
17,200	86,000	.036100	.003350	....	....	
17,600	88,000	.040300	.004200	....	....	
18,000	90,000	.044750	.004450	....	....	
18,400	92,000	.050500	.005750	....	....	
18,800	94,000	.057850	.007850	....	....	
19,200	96,000	.0650	.007150	....	....	
19,600	98,000	.0850	.0200	....	....	
19,810	99,050	.1100	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	99,050
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1850
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		″.70 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.28, ″.69

No. 721.

Marks, $^{5\,R_1\,J}_{B\,T_{12}\,M}$
Length, 4''.52.
Diameter, ''.799.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000467	.000200	0.	....	
10,000	20,000	.000633	.000166	0.	....	
12,500	25,000	.000800	.000167	0.	....	
15,000	30,000	.000933	.000133	.000033	.000033	
17,500	35,000	.001100	.000167	.000033	0.	
20,000	40,000	.001300	.000200	.000067	.000034	
22,500	45,000	.001500	.000200	....	....	
25,000	50,000	.001667	.000167	....	....	
25,500	51,000	.001700	.000033	....	....	
26,000	52,000	.001733	.000033	....	....	
26,500	53,000	.001767	.000034	....	....	
27,000	54,000	.001833	.000066	....	....	
27,500	55,000	.001867	.000034	....	....	
28,000	56,000	.001933	.000066	....	....	
28,500	57,000	.001967	.000034	....	....	Elastic limit.
29,000	58,000	.002067	.000100	....	....	
29,500	59,000	.002167	.000100	....	....	
30,000	60,000	.002333	.000166	....	....	
30,500	61,000	.002600	.000267	....	....	
31,000	62,000	.003200	.000600	....	....	
31,500	63,000	.003667	.000467	....	....	
32,000	64,000	.004167	.000500	....	....	
32,500	65,000	.005067	.000900	....	....	
51,610	103,220	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 2927.

Marks, $\overset{5\ R_1\ J}{M\ T_2\ M}$.
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000400	.000100	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001550	.000200	....	....	
9,200	46,000	.001600	.000050	....	....	
9,400	47,000	.001700	.000100	....	....	Elastic limit.
9,600	48,000	.001900	.000200	....	....	
9,800	49,000	.002300	.000400	....	....	
10,000	50,000	.003000	.000700	....	....	
10,200	51,000	.003900	.000900	....	....	
10,400	52,000	.004500	.000600	....	....	
10,600	53,000	.005150	.000650	....	....	
10,800	54,000	.006000	.000850	....	....	
11,200	56,000	.007550	.001550	....	....	
11,600	58,000	.009000	.001450	....	....	
12,000	60,000	.010650	.001650	....	....	
12,400	62,000	.012100	.001450	....	....	
12,800	64,000	.013750	.001650	....	....	
13,200	66,000	.015500	.001750	....	....	
13,600	68,000	.017000	.001500	....	....	
14,000	70,000	.018750	.001750	....	....	
14,400	72,000	.020600	.001850	....	....	
14,800	74,000	.023250	.002650	....	....	
15,200	76,000	.025500	.002250	....	....	
15,600	78,000	.027500	.002000	....	....	
16,000	80,000	.030000	.002500	....	....	
16,400	82,000	.032900	.002900	....	....	
16,800	84,000	.036250	.003350	....	....	
17,200	86,000	.039250	.003000	....	....	
17,600	88,000	.044000	.004750	....	....	
18,000	90,000	.048900	.004900	....	....	
18,400	92,000	.054250	.005350	....	....	
18,800	94,000	.0575	.003250	....	....	
19,200	96,000	.0650	.0075	....	....	
19,000	98,000	.0850	.0200	....	....	
19,920	99,600	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	99,600
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.1250
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.045
Reduction in area after rupture, per centum of original section		16.9
Position of rupture		".35 from neck
Character of broken surface		granular; line of flaky metal
Elongation of inch sections		".12, ".13

No. 2928.

Marks, $^{5\,B_1\,J}_{M\,T_4\,M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000400	.000100	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001100	.000150	0.	....	
8,000	40,000	.001250	.000150	.000050	.000050	
8,200	41,000	.001300	.000050	....	....	
8,400	42,000	.001350	.000050	....	....	
8,600	43,000	.001450	.000100	....	....	
8,800	44,000	.001500	.000050	....	....	
9,000	45,000	.001550	.000050	....	....	
9,200	46,000	.001650	.000100	....	....	
9,400	47,000	.001650	0.	....	....	
9,600	48,000	.001750	.000100	....	....	Elastic limit.
9,800	49,000	.002200	.000450	....	....	
10,000	50,000	.003050	.000850	....	....	
10,200	51,000	.003700	.000650	....	....	
10,400	52,000	.004300	.000600	....	....	
10,600	53,000	.005000	.000700	....	....	
10,800	54,000	.005900	.000900	....	....	
11,000	55,000	.006500	.000600	....	....	
11,200	56,000	.007300	.000800	....	....	
11,600	58,000	.009000	.001700	....	....	
12,000	60,000	.010650	.001650	....	....	
12,400	62,000	.012400	.001750	....	....	
12,800	64,000	.014000	.001600	....	....	
13,200	66,000	.015850	.001850	....	....	
13,600	68,000	.017600	.001750	....	....	
14,000	70,000	.019500	.001900	....	....	
14,400	72,000	.021500	.002000	....	....	
14,800	74,000	.023500	.002000	....	....	
15,200	76,000	.026000	.002500	....	....	
15,600	78,000	.028500	.002500	....	....	
16,000	80,000	.031250	.002750	....	....	
16,400	82,000	.034050	.002800	....	....	
16,800	84,000	.037500	.003450	....	....	
17,200	86,000	.041500	.004000	....	....	
17,600	88,000	.045600	.004100	....	....	
18,000	90,000	.051000	.005400	....	....	
18,400	92,000	.0550	.0040	....	....	
18,800	94,000	.0600	.0050	....	....	
19,200	96,000	.0750	.0150	....	....	
19,590	97,950	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	97,950
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.1150
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.025
Reduction in area after rupture, per centum of original section		18.2
Position of rupture		1″.07 from neck
Character of broken surface		granular; line of flaky metal
Elongation of inch sections		″.10, ″.13

No. 3069.

Marks, $\overset{5\ \mathrm{B_1\ J}}{\mathrm{M\ T_5\ M}}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000800	.000150	0.	....	
6,000	30,000	.001000	.000200	0.	....	
7,000	35,000	.001150	.000150	....	....	
8,000	40,000	.001300	.000150	....	....	
8,200	41,000	.001300	0.	....	....	
8,400	42,000	.001350	.000050	....	....	
8,600	43,000	.001350	0.	....	....	
8,800	44,000	.001400	.000050	....	....	
9,000	45,000	.001450	.000050	....	....	
9,200	46,000	.001500	.000050	....	....	
9,400	47,000	.001550	.000050	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	
10,600	53,000	.001800	0.	....	....	Elastic limit.
10,800	54,000	.002000	.000200	....	....	
11,000	55,000	.004200	.002200	....	....	
11,200	56,000	.005500	.001300	....	....	
11,400	57,000	.006500	.001000	....	....	
11,600	58,000	.007500	.001000	....	....	
11,800	59,000	.008500	.001000	....	....	
12,000	60,000	.009500	.001000	....	....	
12,400	62,000	.011600	.002100	....	....	
12,800	64,000	.013400	.001800	....	....	
13,200	66,000	.015400	.002000	....	....	
13,600	68,000	.017500	.002100	....	....	
14,000	70,000	.019800	.002300	....	....	
14,400	72,000	.022250	.002450	....	....	
14,800	74,000	.025000	.002750	....	....	
15,200	76,000	.027550	.002550	....	....	
15,600	78,000	.030400	.002850	....	....	
16,000	80,000	.034100	.003700	....	....	
16,400	82,000	.037750	.003050	....	....	
16,800	84,000	.042250	.004500	....	....	
17,200	86,000	.047100	.004850	....	....	
17,600	88,000	.054000	.006900	....	....	
18,000	90,000	.0600	.0060	....	....	
18,400	92,000	.0700	.0100	....	....	
18,800	94,000	.0950	.0250	....	....	
18,960	94,800	.1350	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 94,800
Elastic limit per square inch of original section..........do.... 53,000
Elongation per inch after rupture..........inch.. 0.2400
Elongation per inch under strain at elastic limit..........do.... .001800
Reduction in diameter at point of rupture..........do.... .135
Reduction in area after rupture, per centum of original section.......... 46.2
Position of rupture.......... ".80 from neck
Character of broken surface..........silky
Elongation of inch sections..........".14, ".34*

No. 3070.

Marks, $^{5\ R_1\ J}_{M\ T_6\ M}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000400	.000100	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000900	.000150	0.	....	
7,000	35,000	.001150	.000250	....	....	
8,000	40,000	.001350	.000200	....	....	
8,200	41,000	.001400	.000050	....	....	
8,400	42,000	.001400	0.	....	....	
8,600	43,000	.001450	.000050	....	....	
8,800	44,000	.001450	0.	....	....	
9,000	45,000	.001500	.000050	....	....	
9,200	46,000	.001550	.000050	....	....	
9,400	47,000	.001550	0.	....	....	
9,600	48,000	.001600	.000050	....	....	
9,800	49,000	.001650	.000050	....	....	
10,000	50,000	.001700	.000050	....	....	
10,200	51,000	.001750	.000050	....	....	
10,400	52,000	.001800	.000050	....	....	
10,600	53,000	.001850	.000050	....	....	
10,800	54,000	.001900	.000050	....	....	Elastic limit.
11,000	55,000	.002550	.000650	....	....	
11,200	56,000	.003550	.001000	....	....	
11,400	57,000	.005050	.001500	....	....	
11,600	58,000	.006150	.001100	....	....	
11,800	59,000	.007000	.000850	....	....	
12,000	60,000	.008250	.001250	....	....	
12,400	62,000	.010050	.001800	....	....	
12,800	64,000	.012000	.001950	....	....	
13,200	66,000	.013750	.001750	....	....	
13,600	68,000	.016000	.002250	....	....	
14,000	70,000	.018000	.002000	....	....	
14,400	72,000	.020250	.002250	....	....	
14,800	74,000	.022700	.002450	....	....	
15,200	76,000	.025350	.002650	....	....	
15,600	78,000	.028250	.002900	....	....	
16,000	80,000	.031500	.003250	....	....	
16,400	82,000	.035000	.003500	....	....	
16,800	84,000	.039000	.004000	....	....	
17,200	86,000	.043750	.004750	....	....	
17,600	88,000	.049000	.005250	....	....	
18,000	90,000	.056250	.007250	....	....	
18,400	92,000	.0600	.003750	....	....	
18,800	94,000	.0800	.0200	....	....	
19,170	95,850	.1150	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	95,850
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.2200
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.11

7-INCH B. L. HOWITZER.—OBTURATOR STEM FORGING.

No. 709.

Marks, $7\ H\ \frac{B_1}{L_1}\ O\ S$
Length, 4″.5.
Diameter, ″.798.
Sectional area, .50 square inch.

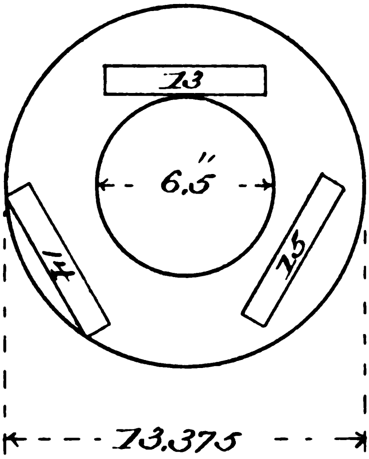
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000233	.000133	0.	....	
7,500	15,000	.000400	.000167	0.	....	
10,000	20,000	.000567	.000167	0.	....	
12,500	25,000	.000767	.000200	0.	....	
15,000	30,000	.000933	.000166	.000033	.000033	
17,500	35,000	.001100	.000167	.000033	0.	
20,000	40,000	.001267	.000167	.000033	0.	
22,500	45,000	.001433	.000166	.000033	0.	
23,000	46,000	.001433	0.	....	....	
23,500	47,000	.001467	.000034	....	....	
24,000	48,000	.001500	.000033	....	....	
24,500	49,000	.001533	.000033	....	....	
25,000	50,000	.001567	.000034	.000033	0.	
25,500	51,000	.001600	.000033	....	....	
26,000	52,000	.001600	0.	....	....	
26,500	53,000	.001633	.000033	....	....	
27,000	54,000	.001667	.000034	....	....	
27,500	55,000	.001667	0.	....	....	
28,000	56,000	.001700	.000033	....	....	
28,500	57,000	.001700	0.	....	....	
29,000	58,000	.001700	0.	....	....	
29,500	59,000	.001633	—.000067	....	....	Elastic limit.
30,000	60,000	.005167	.003534	....	....	
30,500	61,000	.006100	.000933	....	....	
31,000	62,000	.007567	.001467	....	....	
31,500	63,000	.008400	.000833	....	....	
32,000	64,000	.009000	.000600	....	....	
32,500	65,000	.010100	.001100	....	....	
47,380	94,760	....	....	....	....	Ultimate strength.

Failed by triple flexure.

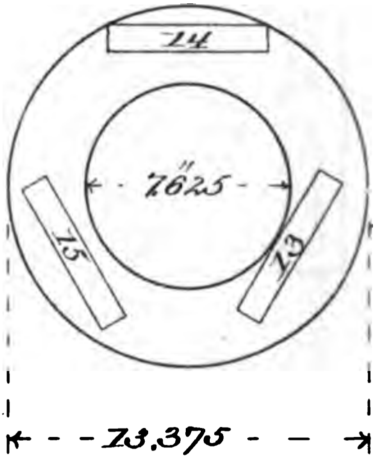
8 inch converted Rifles

3d Tube No. 7

Breech



Muzzle



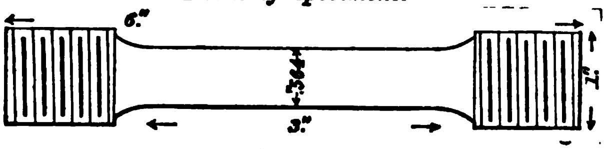
Ex No 16 50, 1.

8-INCH CONVERTED RIFLES.

SPECIMENS FROM STEEL TUBES.

DETAILS OF TESTS.

Form of specimens.



No. 2813.

Marks, $^{\text{8 Cn Br T}}_{\text{B T}_{18}\text{ I}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	....	....	
2,500	10,000	.000233	.000166	....	....	
3,750	15,000	.000400	.000167	....	....	
5,000	20,000	.000567	.000167	....	....	
6,250	25,000	.000733	.000166	....	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001133	.000233	0.	....	
10,000	40,000	.001367	.000234	.000033	.000033	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001567	.000100	....	....	
11,250	45,000	.001600	.000033	....	....	
11,500	46,000	.001633	.000033	....	....	
11,750	47,000	.001700	.000067	....	....	Elastic limit.
12,000	48,000	.002967	.001267	....	....	
12,250	49,000	.004000	.001033	....	....	
12,500	50,000	.005667	.001667	....	....	
13,000	52,000	.008000	.002333	....	....	
13,500	54,000	.010000	.002000	....	....	
14,000	56,000	.012133	.002133	....	....	
14,500	58,000	.014400	.002267	....	....	
15,000	60,000	.016667	.002267	....	....	
15,500	62,000	.019600	.002933	....	....	
16,000	64,000	.022333	.002733	....	....	
16,500	66,000	.025200	.002867	....	....	
17,000	68,000	.028667	.003467	....	....	
17,500	70,000	.032233	.003566	....	....	
18,000	72,000	.036500	.004267	....	....	
18,500	74,000	.041500	.005000	....	....	
19,000	76,000	.046667	.005167	....	....	
19,500	78,000	.053667	.007000	....	....	
20,000	80,000	.065833	.012166	....	....	
20,500	82,000	.0733	.007467	....	....	
21,000	84,000	.1000	.0267	....	....	
21,200	84,800	.1533	.0533	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	84,800
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.2067
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		".60 from neck
Character of broken surface		silky
Elongation of inch sections		".11, ".18, ".38*

No. 2814.

Marks, $^{8\,Cn\,R_7\,T}_{B\,T_{14}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	....	....	
2,500	10,000	.000267	.000167	....	....	
3,750	15,000	.000433	.000166	....	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	....	....	
7,500	30,000	.000967	.000200	....	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001367	.000234	.000167	.000167	Elastic limit.
10,250	41,000	.001467	.000100	....	....	
10,500	42,000	.002267	.000800	....	....	
10,750	43,000	.004400	.002133	....	....	
11,000	44,000	.005100	.000700	....	....	
11,250	45,000	.006600	.001500	....	....	
11,500	46,000	.006933	.000333	....	....	
11,750	47,000	.007933	.001000	....	....	
12,000	48,000	.008800	.000867	....	....	
12,250	49,000	.009900	.001100	....	....	
12,500	50,000	.010933	.001033	....	....	
13,000	52,000	.012867	.001934	....	....	
13,500	54,000	.015167	.002300	....	....	
14,000	56,000	.017167	.002000	....	....	
14,500	58,000	.019700	.002533	....	....	
15,000	60,000	.022400	.002700	....	....	
15,500	62,000	.025267	.002867	....	....	
16,000	64,000	.028500	.003233	....	....	
16,500	66,000	.031600	.003100	....	....	
17,000	68,000	.035767	.004167	....	....	
17,500	70,000	.040033	.004266	....	....	
18,000	72,000	.044833	.004800	....	....	
18,500	74,000	.050333	.005500	....	....	
19,000	76,000	.059333	.009000	....	....	
19,500	78,000	.0700	.010667	....	....	
20,000	80,000	.0833	.0133	....	....	
20,500	82,000	.1067	.0234	....	....	
20,800	83,200	.1667	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	83,200
Elastic limit per square inch of original section	do	40,000
Elongation per inch after rupture	inch	0.2233
Elongation per inch under strain at elastic limit	do	.001367
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.15 from neck
Character of broken surface		silky
Elongation of inch sections		″.10, ″.20, ″.37

No. 2815.

Marks, $^{8\ Cn\ R_7\ T}_{B\ T_{15}\ M}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	....	....	
2,500	10,000	.000267	.000167	....	....	
3,750	15,000	.000433	.000166	....	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	....	....	
7,500	30,000	.000933	.000166	....	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001233	.000066	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	....	....	
10,250	41,000	.001400	.000067	....	....	
10,500	42,000	.001467	.000067	....	....	Elastic limit.
10,750	43,000	.004000	.002533	....	....	
11,000	44,000	.005667	.001667	....	....	
11,250	45,000	.006400	.000733	....	....	
11,500	46,000	.007233	.000833	....	....	
11,750	47,000	.008300	.001067	....	....	
12,000	48,000	.009267	.000967	....	....	
12,250	49,000	.009933	.000666	....	....	
12,500	50,000	.011200	.001267	....	....	
13,000	52,000	.013500	.002300	....	....	
13,500	54,000	.015567	.002067	....	....	
14,000	56,000	.018000	.002433	....	....	
14,500	58,000	.020700	.002700	....	....	
15,000	60,000	.023200	.002500	....	....	
15,500	62,000	.026100	.002900	....	....	
16,000	64,000	.029733	.003633	....	....	
16,500	66,000	.033267	.003534	....	....	
17,000	68,000	.037667	.004400	....	....	
17,500	70,000	.042167	.004500	....	....	
18,000	72,000	.048000	.005833	....	....	
18,500	74,000	.055667	.007667	....	....	
19,000	76,000	.0667	.011033	....	....	
19,500	78,000	.0767	.0100	....	....	
20,000	80,000	.1000	.0233	....	....	
20,500	82,000	.1667	.0667	....	....	Tensile strength.

General summary.

Specific gravity		7.8557
Hardness		14.83
Tensile strength per square inch of original section	pounds	82,000
Elastic limit per square inch of original section	do	42,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001467
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		''.95 from neck
Character of broken surface		silky
Elongation of inch sections		''.12, ''.20, ''.40*

No. 2816.

Marks, $^{\text{8 Cn R}_r\text{T}}_{\text{M T}_{12}\text{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	....	....	
2,500	10,000	.000333	.000166	....	....	
3,750	15,000	.000500	.000167	....	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	....	....	
7,500	30,000	.001000	.000167	....	....	
8,750	35,000	.001200	.000200	0.	....	
9,000	36,000	.001233	.000033	....	....	
9,250	37,000	.001267	.000034	....	....	
9,500	38,000	.001300	.000033	....	....	
9,750	39,000	.001333	.000033	....	....	
10,000	40,000	.001367	.000034	....	....	
10,250	41,000	.001433	.000066	....	....	
10,500	42,000	.001500	.000067	....	....	
10,750	43,000	.001533	.000033	....	....	
11,000	44,000	.001600	.000067	....	....	Elastic limit.
11,250	45,000	.001833	.000233	....	....	
11,500	46,000	.002567	.000734	....	....	
11,750	47,000	.003900	.001333	....	....	
12,000	48,000	.004733	.000833	....	....	
12,250	49,000	.005767	.001034	....	....	
12,500	50,000	.006467	.000700	....	....	
13,000	52,000	.008333	.001866	....	....	
13,500	54,000	.010400	.002067	....	....	
14,000	56,000	.012333	.001933	....	....	
14,500	58,000	.014100	.001767	....	....	
15,000	60,000	.015767	.001667	....	....	
15,500	62,000	.018233	.002466	....	....	
16,000	64,000	.020133	.001900	....	....	
16,500	66,000	.022733	.002600	....	....	
17,000	68,000	.025333	.002600	....	....	
17,500	70,000	.028067	.002734	....	....	
18,000	72,000	.031333	.003266	....	....	
18,500	74,000	.034667	.003334	....	....	
19,000	76,000	.038667	.004000	....	....	
19,500	78,000	.043333	.004666	....	....	
20,000	80,000	.049000	.005667	....	....	
20,500	82,000	.0567	.0077	....	....	
21,000	84,000	.0633	.0066	....	....	
21,500	86,000	.0767	.0134	....	....	
22,000	88,000	.1000	.0233	....	....	
22,400	89,600	.1567	.0567	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	89,600
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.1767
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		″.68 from neck
Character of broken surface		granular; belt of flaky metal
Elongation of inch sections		″.28*, ″.14, ″.11

No. 2886.

Marks, $^{8\,Cn\,R_7\,T}_{M\,T_{16}\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001233	.000066	....	....	
9,750	39,000	.001300	.000067	....	....	
10,000	40,000	.001333	.000033	....	....	
10,250	41,000	.001400	.000067	....	....	Elastic limit.
10,500	42,000	.002067	.000667	....	....	
10,750	43,000	.002500	.000433	....	....	
11,000	44,000	.003100	.000600	....	....	
11,250	45,000	.003767	.000667	....	....	
11,500	46,000	.005833	.002066	....	....	
11,750	47,000	.006767	.000934	....	....	
12,000	48,000	.008000	.001233	....	....	
12,250	49,000	.008767	.000767	....	....	
12,500	50,000	.010000	.001233	....	....	
13,000	52,000	.012167	.002167	....	....	
13,500	54,000	.014500	.002333	....	....	
14,000	56,000	.016667	.002167	....	....	
14,500	58,000	.019167	.002500	....	....	
15,000	60,000	.021933	.002766	....	....	
15,500	62,000	.024867	.002934	....	....	
16,000	64,000	.027667	.002800	....	....	
16,500	66,000	.031667	.004000	....	....	
17,000	68,000	.035000	.003333	....	....	
17,500	70,000	.039167	.004167	....	....	
18,000	72,000	.044667	.005500	....	....	
18,500	74,000	.051833	.007166	....	....	
19,000	76,000	.059000	.007167	....	....	
19,500	78,000	.0700	.0110	....	....	
20,000	80,000	.0900	.0200	....	....	
20,500	82,000	.1200	.0300	....	....	
20,550	82,200	.1400	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	82,200
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.1667
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		".25 from neck
Character of broken surface		granular; flaky spot at circumference
Diameter		".25 from fracture, ".48
Elongation of inch sections		".11, ".14, ".25

No. 2818.

Marks, ${}^{8\,\mathrm{Cn\,B_t\,T}}_{\mathrm{M\,T_{15}\,M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000233	.000233	0.	....	
2,500	10,000	.000400	.000167	0.	....	
3,750	15,000	.000567	.000167	0.	....	
5,000	20,000	.000700	.000133	.000100	.000100	
6,250	25,000	.000900	.000200	.000100	0.	
7,500	30,000	.001067	.000167	.000100	0.	
8,750	35,000	.001233	.000166	.000133	.000033	
9,000	36,000	.001300	.000067	....	....	
9,250	37,000	.001333	.000033	....	....	
9,500	38,000	.001367	.000034	....	....	
9,750	39,000	.001400	.000033	....	....	
10,000	40,000	.001500	.000100	....	....	
10,250	41,000	.001533	.000033	....	....	
10,500	42,000	.001600	.000067	....	....	Elastic limit.
10,750	43,000	.001700	.000100	....	....	
11,000	44,000	.002300	.000600	....	....	
11,250	45,000	.003367	.001067	....	....	
11,500	46,000	.004367	.001000	....	....	
11,750	47,000	.005333	.000966	....	....	
12,000	48,000	.006333	.001000	....	....	
12,250	49,000	.007233	.000900	....	....	
12,500	50,000	.008233	.001000	....	....	
13,000	52,000	.009900	.001667	....	....	
13,500	54,000	.012500	.002600	....	....	
14,000	56,000	.014067	.001567	....	....	
14,500	58,000	.016400	.002333	....	....	
15,000	60,000	.018700	.002300	....	....	
15,500	62,000	.021333	.002633	....	....	
16,000	64,000	.024033	.002700	....	....	
16,500	66,000	.026900	.002867	....	....	
17,000	68,000	.029867	.002967	....	....	
17,500	70,000	.033433	.003566	....	....	
18,000	72,000	.037667	.004234	....	....	
18,500	74,000	.042667	.005000	....	....	
19,000	76,000	.047867	.005200	....	....	
19,500	78,000	.055833	.007966	....	....	
20,000	80,000	.062000	.006167	....	....	
20,500	82,000	.0767	.0147	....	....	
21,000	84,000	.1000	.0233	....	....	
21,400	85,600	.1600	.0600	....	....	Tensile strength.

General summary.

Specific gravity		7.8365
Hardness		15.91
Tensile strength per square inch of original section	pounds	85,600
Elastic limit per square inch of original section	do	42,000
Elongation per inch after rupture	inch	0.2033
Elongation per inch under strain at elastic limit	do	.001000
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.47 from neck
Character of broken surface		granular; dull spot at circumference
Elongation of inch sections		″.13, ″.24*, ″.24
Diameter		″.25 from fracture, ″.48

No. 2886.

Marks, $^{8\,\mathrm{Cn}\,\mathrm{B}_7\,\mathrm{T}}_{\mathrm{M}\,\mathrm{T}_{16}\,\mathrm{I}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001233	.000066	....	....	
9,750	39,000	.001300	.000067	....	....	
10,000	40,000	.001333	.000033	....	....	
10,250	41,000	.001400	.000067	....	....	Elastic limit.
10,500	42,000	.002067	.000667	....	....	
10,750	43,000	.002500	.000433	....	....	
11,000	44,000	.003100	.000600	....	....	
11,250	45,000	.003767	.000667	....	....	
11,500	46,000	.005833	.002066	....	....	
11,750	47,000	.006767	.000934	....	....	
12,000	48,000	.008000	.001233	....	....	
12,250	49,000	.008767	.000767	....	....	
12,500	50,000	.010000	.001233	....	....	
13,000	52,000	.012167	.002167	....	....	
13,500	54,000	.014500	.002333	....	....	
14,000	56,000	.016667	.002167	....	....	
14,500	58,000	.019167	.002500	....	....	
15,000	60,000	.021933	.002766	....	....	
15,500	62,000	.024867	.002934	....	....	
16,000	64,000	.027667	.002800	....	....	
16,500	66,000	.031667	.004000	....	....	
17,000	68,000	.035000	.003333	....	....	
17,500	70,000	.039167	.004167	....	....	
18,000	72,000	.044667	.005500	....	....	
18,500	74,000	.051833	.007166	....	....	
19,000	76,000	.059000	.007167	....	....	
19,500	78,000	.0700	.0110	....	....	
20,000	80,000	.0900	.0200	....	....	
20,500	82,000	.1200	.0300	....	....	
20,550	82,200	.1400	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	82,200
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.1667
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		".25 from neck
Character of broken surface		granular; flaky spot at circumference
Diameter		".25 from fracture, ".48
Elongation of inch sections		".11, ".14, ".25*

No. 2887.

Marks, $\substack{8\,Cn\,R_7\,T \\ M\,T_{17}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000433	.000100	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	....	....	
10,250	41,000	.001333	.000066	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	
11,000	44,000	.001433	.000083	....	....	
11,250	45,000	.001500	.000067	....	....	Elastic limit.
11,500	46,000	.001833	.000333	....	....	
11,750	47,000	.002733	.000900	....	....	
12,000	48,000	.004167	.001434	....	....	
12,250	49,000	.005233	.001066	....	....	
12,500	50,000	.006700	.001467	....	....	
13,000	52,000	.008667	.001967	....	....	
13,500	54,000	.010833	.002166	....	....	
14,000	56,000	.013033	.002200	....	....	
14,500	58,000	.015233	.002200	....	....	
15,000	60,000	.017533	.002300	....	....	
15,500	62,000	.020167	.002634	....	....	
16,000	64,000	.022733	.002566	....	....	
16,500	66,000	.025500	.002767	....	....	
17,000	68,000	.029000	.003500	....	....	
17,500	70,000	.032500	.003500	....	....	
18,000	72,000	.036400	.003900	....	....	
18,500	74,000	.041333	.004933	....	....	
19,000	76,000	.046833	.005500	....	....	
19,500	78,000	.054000	.007167	....	....	
20,000	80,000	.0667	.0127	....	....	
20,500	82,000	.0767	.0100	....	....	
21,000	84,000	.1033	.0266	....	....	
21,150	84,600	.1833	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	84,600
Elastic limit per square inch of original section	do .	45,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		44.0
Position of rupture		″.65 from neck
Character of broken surface		silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		″.34*, ″.15, ″.11

No. 2888.

Marks, $\overset{8\,C_2\,R_7\,T}{M\,T_{12}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000833	.000200	.000033	.000033	
7, 500	30, 000	.001033	.000200	.000067	.000034	
8, 750	35, 000	.001233	.000200	....	....	
9, 000	36, 000	.001267	.000034	....	....	
9, 250	37, 000	.001300	.000033	....	....	
9, 500	38, 000	.001367	.000067	....	....	
9, 750	39, 000	.001400	.000033	....	....	
10, 000	40, 000	.001467	.000067	....	....	
10, 250	41, 000	.001567	.000100	....	....	
10, 500	42, 000	.001633	.000066	....	....	
10, 750	43, 000	.001700	.000067	....	....	Elastic limit.
11, 000	44, 000	.002300	.000600	....	....	
11, 250	45, 000	.003667	.001367	....	....	
11, 500	46, 000	.004967	.001300	....	....	
11, 750	47, 000	.005800	.000833	....	....	
12, 000	48, 000	.006700	.000900	....	....	
12, 250	49, 000	.007533	.000833	....	....	
12, 500	50, 000	.008533	.001000	....	....	
13, 000	52, 000	.010500	.001967	....	....	
13, 500	54. 000	.012667	.002167	....	....	
14, 000	56, 000	.014500	.001833	....	....	
14, 500	58, 000	.016667	.002167	....	....	
15, 000	60, 000	.018867	.002200	....	....	
15, 500	62, 000	.021333	.002466	....	....	
16, 000	64, 000	.024167	.002834	....	....	
16, 500	66, 000	.027167	.003000	....	....	
17, 000	68, 000	.030000	.002833	....	....	
17, 500	70, 000	.033267	.003267	....	....	
18, 000	72, 000	.037333	.004066	....	....	
18, 500	74, 000	.041800	.004467	....	....	
19, 000	76, 000	.046900	.005100	....	....	
19, 500	78, 000	.054000	.007100	....	....	
20, 000	80, 000	.0600	.0060	....	....	
20, 500	82, 000	.0733	.0133	....	....	
21, 000	84, 000	.0933	.0200	....	....	
21, 390	85, 560	.1467	.0534	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85, 560
Elastic limit per square inch of original section	do ...	43, 000
Elongation per inch after rupture	inch..	0. 2400
Elongation per inch under strain at elastic limit	do ...	.001700
Reduction in diameter at point of rupture	do	. 144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		1″. 65 from neck
Character of broken surface		silky
Elongation of inch sections		″. 17, ″. 40*, ″. 15

No. 3010.

Marks, $\substack{8\,\mathrm{Cn\,R,\,T}\\ \mathrm{M\,T_{19}\,I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000633	.000133	0.	....	
6,250	25,000	.000833	.000200	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	....	....	
10,000	40,000	.001333	.000166	....	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001433	.000066	....	....	Elastic limit.
10,750	43,000	.002133	.000700	....	....	
11,000	44,000	.003067	.000934	....	....	
11,250	45,000	.003900	.000833	....	....	
11,500	46,000	.005567	.001667	....	....	
11,750	47,000	.006467	.000900	....	....	
12,000	48,000	.007467	.001000	....	....	
12,250	49,000	.008467	.001000	....	....	
12,500	50,000	.009667	.001200	....	....	
13,000	52,000	.011600	.001933	....	....	
13,500	54,000	.014067	.002467	....	....	
14,000	56,000	.016167	.002100	....	....	
14,500	58,000	.018700	.002533	....	....	
15,000	60,000	.021167	.002467	....	....	
15,500	62,000	.023767	.002600	....	....	
16,000	64,000	.026667	.002900	....	....	
16,500	66,000	.029900	.003233	....	....	
17,000	68,000	.033667	.003767	....	....	
17,500	70,000	.038000	.004333	....	....	
18,000	72,000	.043000	.005000	....	....	
18,500	74,000	.048500	.005500	....	....	
19,000	76,000	.0567	.0082	....	....	
19,500	78,000	.0667	.0100	....	....	
20,000	80,000	.0800	.0133	....	....	
20,500	82,000	.1100	.0300	....	....	
20,520	82,080	.1267	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	82,080
Elastic limit per square inch of original section	do	42,000
Elongation per inch after rupture	inch	0.1300
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		1″.05 from neck
Character of broken surface		granular; flaky spot at circumference
Elongation of inch sections		″.09, ″.13, ″.17

No. 3011.

Marks, $\genfrac{}{}{0pt}{}{\mathrm{8\,Cn\,B_r\,T}}{\mathrm{M\,T_n\,O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	....	....	
10,000	40,000	.001367	.000200	....	....	
10,250	41,000	.001400	.000033	....	....	Elastic limit.
10,500	42,000	.001567	.000167	....	....	
10,750	43,000	.002000	.000433	....	....	
11,000	44,000	.003067	.001067	....	....	
11,250	45,000	.004000	.000933	....	....	
11,500	46,000	.005267	.001267	....	....	
11,750	47,000	.006333	.001066	....	....	
12,000	48,000	.007500	.001167	....	....	
12,250	49,000	.008533	.001033	....	....	
12,500	50,000	.009667	.001134	....	....	
13,000	52,000	.011733	.002066	....	....	
13,500	54,000	.014667	.002934	....	....	
14,000	56,000	.017333	.002666	....	....	
14,500	58,000	.019500	.002167	....	....	
15,000	60,000	.022000	.002500	....	....	
15,500	62,000	.024667	.002667	....	....	
16,000	64,000	.027500	.002833	....	....	
16,500	66,000	.030667	.003167	....	....	
17,000	68,000	.034333	.003666	....	....	
17,500	70,000	.038333	.004000	....	....	
18,000	72,000	.043333	.005000	....	....	
18,500	74,000	.049333	.006000	....	....	
19,000	76,000	.0567	.007367	....	....	
19,500	78,000	.0700	.0133	....	....	
20,000	80,000	.0900	.0200	....	....	
20,490	81,960	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 81,960
Elastic limit per square inch of original section ....do.... 41,000
Elongation per inch after rupture...inch.. 0.1933
Elongation per inch under strain at elastic limit ....do.... .001400
Reduction in diameter at point of rupture..do.... .104
Reduction in area after rupture, per centum of original section.................................... 33.5
Position of rupture..″.90 from neck
Character of broken surface......................granular; radiating from a flaky spot at circumference
Elongation of inch sections...″.10, ″.18, ″.20

No. 3012.

Marks, $\substack{\text{8 Cn R, T}\\ \text{M T, M}}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	....	....	
9, 000	36, 000	.001100	.000033	....	....	
9, 250	37, 000	.001167	.000067	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001233	.000033	....	....	Elastic limit.
10, 000	40, 000	.001333	.000100	....	....	
10, 250	41, 000	.002200	.000867	....	....	
10, 500	42, 000	.004333	.002133	....	....	
10, 750	43, 000	.005667	.001334	....	....	
11, 000	44, 000	.006667	.001000	....	....	
11, 250	45, 000	.007433	.000766	....	....	
11, 500	46, 000	.008667	.001234	....	....	
11, 750	47, 000	.009667	.001000	....	....	
12, 000	48, 000	.010400	.000733	....	....	
12, 250	49, 000	.011333	.000933	....	....	
12, 500	50, 000	.012167	.000834	....	....	
13, 000	52, 000	.014500	.002333	....	....	
13, 500	54, 000	.016500	.002000	....	....	
14, 000	56, 000	.018933	.002433	....	....	
14, 500	58, 000	.021467	.002534	....	....	
15, 000	60, 000	.024333	.002866	....	....	
15, 500	62, 000	.027233	.002900	....	....	
16, 000	64, 000	.030400	.003167	....	....	
16, 500	66, 000	.034500	.004100	....	....	
17, 000	68, 000	.038667	.004167	....	....	
17, 500	70, 000	.043500	.004833	....	....	
18, 000	72, 000	.048667	.005167	....	....	
18, 500	74, 000	.0533	.004633	....	....	
19, 000	76, 000	.0633	.0100	....	....	
19, 500	78, 000	.0767	.0134	....	....	
20, 000	80, 000	.1000	.0233	....	....	
20, 400	81, 600	.1567	.0567	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	81, 600
Elastic limit per square inch of original section	do	39, 000
Elongation per inch after rupture	inch	0. 2333
Elongation per inch under strain at elastic limit	do	.001233
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		''.85 from neck
Character of broken surface		silky
Elongation of inch sections		''.14, ''.18, ''.38

No. 3083.

Marks, $^{8\,Cn\,R_7\,T}_{M\,T_n\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001167	0.	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001267	.000067	....	....	
10,000	40,000	.001333	.000066	....	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	Elastic limit.
10,750	43,000	.001633	.000233	....	....	
11,000	44,000	.004000	.002367	....	....	
11,250	45,000	.005333	.001333	....	....	
11,500	46,000	.006333	.001000	....	....	
11,750	47,000	.007333	.001000	....	....	
12,000	48,000	.008333	.001000	....	....	
12,250	49,000	.009333	.001000	....	....	
12,500	50,000	.010567	.001234	....	....	
13,000	52,000	.012467	.001900	....	....	
13,500	54,000	.014667	.002200	....	....	
14,000	56,000	.016900	.002233	....	....	
14,500	58,000	.019333	.002433	....	....	
15,000	60,000	.0217.3	.002400	....	....	
15,500	62,000	.024667	.002934	....	....	
16,000	64,000	.027567	.002900	....	....	
16,500	66,000	.031033	.003034	....	....	
17,000	68,000	.034 67	.003634	....	....	
17,500	70,000	.038933	.004266	....	....	
18,000	72,000	.044500	.005567	....	....	
18,500	74,000	.049867	.005367	....	....	
19,000	76,000	.0567	.006833	....	....	
19,500	78,000	.0667	.0100	....	....	
20,000	80,000	.0767	.0100	....	....	
20,500	82,000	.1100	.0333	....	....	
20,580	82,320	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	82,320
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.1167
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		1″.10 from neck
Character of broken surface		granular
Elongation of inch sections		″.10, ″.12, ″.18*

No. 3084.

Marks, $\begin{smallmatrix}\text{8 Cn R, T}\\ \text{M T}_{28}\text{ O}\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Ponnds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001167	.000234	....	....	
9,000	36,000	.001233	.000066	....	....	
9,250	37,000	.001267	.000034	....	....	
9,500	38,000	.001333	.000066	....	....	
9,750	39,000	.001367	.000034	....	....	
10,000	40,000	.001433	.000066	....	....	Elastic limit.
10,250	41,000	.001533	.000100	....	....	
10,500	42,000	.001867	.000334	....	....	
10,750	43,000	.004000	.002133	....	....	
11,000	44,000	.005467	.001467	....	....	
11,250	45,000	.006233	.000766	....	....	
11,500	46,000	.006933	.000700	....	....	
11,750	47,000	.007900	.000967	....	....	
12,000	48,000	.009000	.001100	....	....	
12,250	49,000	.009833	.000833	....	....	
12,500	50,000	.011000	.001167	....	....	
13,000	52,000	.013200	.001200	....	....	
13,500	54,000	.015200	.002000	....	....	
14,000	56,000	.017433	.002233	....	....	
14,500	58,000	.019867	.002434	....	....	
15,000	60,000	.022467	.002600	....	....	
15,500	62,000	.025333	.002866	....	....	
16,000	64,000	.028333	.003000	....	....	
16,500	66,000	.031567	.003234	....	....	
17,000	68,000	.035500	.003933	....	....	
17,500	70,000	.039933	.004433	....	....	
18,000	72,000	.045500	.005567	....	....	
18,500	74,000	.051667	.006167	....	....	
19,000	76,000	.059333	.007666	....	....	
19,500	78,000	.0700	.010667	....	....	
20,000	80,000	.0900	.0200	....	....	
20,500	82,000	.1267	.0367	....	....	
20,560	82,240	.1533	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	82,240
Elastic limit per square inch of original section	do ...	40,000
Elongation per inch after rupture	inch..	0.2233
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		1″.70 from neck
Character of broken surface		granular; radiating from a dull spot at the circumference
Elongation of inch sections		″.18, ″.33*, ″.21
Diameter ″.35 from point of rupture		″.46

No. 3085.

Marks, $\substack{8\,Cn\,R,\,T \\ M\,T_{M}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000633	.000133	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	....	....	
9, 000	36, 000	.001167	.000034	....	....	
9, 250	37, 000	.001200	.000033	....	....	
9, 500	38, 000	.001233	.000033	....	....	
9, 750	39, 000	.001267	.000034	....	....	Elastic limit.
10, 000	40, 000	.001400	.000133	....	....	
10, 250	41, 000	.001667	.000267	....	....	
10, 500	42, 000	.003733	.002066	....	....	
10, 750	43, 000	.005000	.001267	....	....	
11, 000	44, 000	.005833	.000833	....	....	
11, 250	45, 000	.006700	.000867	....	....	
11, 500	46, 000	.007767	.001067	....	....	
11, 750	47, 000	.008700	.000933	....	....	
12, 000	48, 000	.009567	.000867	....	....	
12, 250	49, 000	.010233	.000666	....	....	
12, 500	50, 000	.011333	.001100	....	....	
13, 000	52, 000	.013733	.002400	....	....	
13, 500	54, 000	.015833	.002100	....	....	
14, 000	56, 000	.018233	.002400	....	....	
14, 500	58, 000	.020667	.002434	....	....	
15, 000	60, 000	.023033	.002366	....	....	
15, 500	62, 000	.025767	.002734	....	....	
16, 000	64, 000	.029000	.003233	....	....	
16, 500	66, 000	.032000	.003000	....	....	
17, 000	68, 000	.036033	.004033	....	....	
17, 500	70, 000	.040667	.004634	....	....	
18, 000	72, 000	.045667	.005000	....	....	
18, 500	74, 000	.052500	.006833	....	....	
19, 000	76, 000	.060000	.007500	....	....	
19, 500	78, 000	.0667	.0067	....	....	
20, 000	80, 000	.0833	.0166	....	....	
20, 460	81, 840	.1300	.0467	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	81, 840
Elastic limit per square inch of original section	do....	39, 000
Elongation per inch after rupture	inch..	0. 2433
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		1″.26 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.83*, ″.26*

No. 2834.

Marks, $^{8}\,{}^{\mathrm{Cn\,B_{18}T}}_{\mathrm{B\,T_{18}I}}$
Diameter, ".564.
Sectional area, .25 square inch.

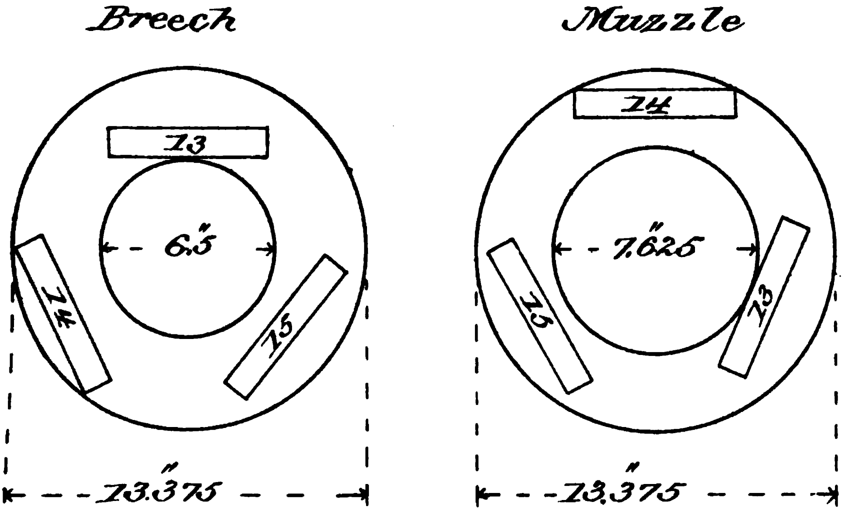
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	....	Initial load.
1,250	5,000	.000133	.000133	....	....	
2,500	10,000	.000267	.000134	....	....	
3,750	15,000	.000400	.000133	.000033	....	
5,000	20,000	.000567	.000167	....	....	
6,250	25,000	.000767	.000200	.000033	....	
7,500	30,000	.000933	.000166	....	....	
8,750	35,000	.001133	.000200	.000033	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001267	.000067	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001367	.000067	....	....	
10,250	41,000	.001433	.000066	....	....	
10,500	42,000	.001467	.000034	....	....	Elastic limit.
10,750	43,000	.002200	.000733	....	....	
11,000	44,000	.004000	.001800	....	....	
11,250	45,000	.005700	.001700	....	....	
11,500	46,000	.006633	.000933	....	....	
11,750	47,000	.007633	.001000	....	....	
12,000	48,000	.008900	.001267	....	....	
12,250	49,000	.009733	.000833	....	....	
12,500	50,000	.010833	.001100	....	....	
13,000	52,000	.013500	.002667	....	....	
13,500	54,000	.015733	.002233	....	....	
14,000	56,000	.018500	.002767	....	....	
14,500	58,000	.021100	.002600	....	....	
15,000	60,000	.024233	.003133	....	....	
15,500	62,000	.027267	.003034	....	....	
16,000	64,000	.030567	.003300	....	....	
16,500	66,000	.035500	.004933	....	....	
17,000	68,000	.039833	.004333	....	....	
17,500	70,000	.045567	.005734	....	....	
18,000	72,000	.051833	.006266	....	....	
18,500	74,000	.0600	.008167	....	....	
19,000	76,000	.0700	.0100	....	....	
19,500	78,000	.0867	.0167	....	....	
20,000	80,000	.1100	.0233	....	....	
20,300	81,200	.1667	.0567	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	81,200
Elastic limit per square inch of original section	do ...	42,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		".90 from neck
Character of broken surface		silky
Elongation of inch sections		".40", ".18, ".14

8 inch converted Rifles

Third tube No. 18



H Ex No 16 50, 1.

No. 2835.

Marks, $\overset{8\,C_3\,B_{18}\,T}{B\,T_{14}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000233	.000233	0.	....	
2,500	10,000	.000433	.000200	0.	....	
3,750	15,000	.000600	.000167	.000033	.000033	
5,000	20,000	.000700	.000100	....	....	
6,250	25,000	.000867	.000167	....	....	
7,500	30,000	.001033	.000166	.000033	0.	
8,750	35,000	.001200	.000167	....	....	
9,000	36,000	.001233	.000033	....	....	
9,250	37,000	.001267	.000034	....	....	Elastic limit.
9,500	38,000	.001367	.000100	....	....	
9,750	39,000	.005967	.004600	....	....	
10,000	40,000	.006700	.000733	....	....	
10,250	41,000	.007533	.000833	....	....	
10,500	42,000	.008700	.001167	....	....	
10,750	43,000	.009833	.001133	....	....	
11,000	44,000	.010700	.000867	....	....	
11,500	46,000	.012800	.002100	....	....	
12,000	48,000	.014967	.002167	....	....	
12,500	50,000	.017567	.002600	....	....	
13,000	52,000	.020100	.002533	....	....	
13,500	54,000	.022700	.002600	....	....	
14,000	56,000	.026000	.003300	....	....	
14,500	58,000	.029067	.003067	....	....	
15,000	60,000	.033000	.003933	....	....	
15,500	62,000	.036667	.003667	....	....	
16,000	64,000	.042333	.005666	....	....	
16,500	66,000	.047333	.005000	....	....	
17,000	68,000	.054200	.006867	....	....	
17,500	70,000	.062667	.008467	....	....	
18,000	72,000	.0733	.010633	....	....	
18,500	74,000	.0900	.0167	....	....	
19,000	76,000	.1100	.0200	....	....	
19,400	77,600	.1833	.0733	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	77,600
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.15 from middle
Character of broken surface		silky
Elongation of inch sections	m	″.14, ″.41*, ″.17

No. 2836.

Marks, $^{8}{}^{\text{Cn R}_{13}\text{ T}}_{\text{B T}_{15}\text{ M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000200	.000200	....	....	
2, 500	10, 000	.000400	.000200	....	....	
3, 750	15, 000	.000567	.000167	....	....	
5, 000	20, 000	.000733	.000166	....	....	
6, 250	25, 000	.000900	.000167	—.000033	—.000033	
7, 500	30, 000	.001067	.000167	....	....	
8, 750	35, 000	.001267	.000200	0.	.000033	
9, 000	36, 000	.001333	.000066	....	....	
9, 250	37, 000	.001367	.000034	....	....	
9, 500	38, 000	.001433	.000066	....	....	
9, 750	39, 000	.001467	.000034	....	....	
10, 000	40, 000	.001533	.000066	....	....	
10, 250	41, 000	.001567	.000034	....	....	
10, 500	42, 000	.001633	.000066	....	....	Elastic limit.
10, 750	43, 000	.001767	.000134	....	....	
11, 000	44, 000	.005833	.004066	....	....	
11, 250	45, 000	.006500	.000667	....	....	
11, 500	46, 000	.007467	.000967	....	....	
11, 750	47, 000	.008400	.000933	....	....	
12, 000	48, 000	.009333	.000933	....	....	
12, 250	49, 000	.010600	.001267	....	....	
12, 500	50, 000	.011600	.001000	....	....	
13, 000	52, 000	.013900	.002300	....	....	
13, 500	54, 000	.016567	.002667	....	....	
14, 000	56, 000	.018933	.002366	....	....	
14, 500	58, 000	.021833	.002900	....	....	
15, 000	60, 000	.024867	.003034	....	....	
15, 500	62, 000	.028167	.003300	....	....	
16, 000	64, 000	.031600	.003433	....	....	
16, 500	66, 000	.036000	.004400	....	....	
17, 000	68, 000	.040333	.004333	....	....	
17, 500	70, 000	.046333	.006000	....	....	
18, 000	72, 000	.052667	.006334	....	....	
18, 500	74, 000	.0600	.007333	....	....	
19, 000	76, 000	.0733	.0133	....	....	
19, 500	78, 000	.0900	.0167	....	....	
20, 000	80, 000	.1133	.0233	....	....	
20, 200	80, 800	.1667	.0534	....	....	Tensile strength.

General summary.

Specific gravity	7.8533
Hardness	16.99
Tensile strength per square inch of original section ....pounds..	80, 800
Elastic limit per square inch of original section ....do ...	42, 000
Elongation per inch after rupture ....inch..	0.2367
Elongation per inch under strain at elastic limit ....do....	.001633
Reduction in diameter at point of rupture ....do....	.154
Reduction in area after rupture, per centum of original section	47.2
Position of rupture	1″ from neck
Character of broken surface	silky
Elongation of inch sections	″.37*, ″.21, ″.13

No. 2837.

Marks, $\begin{smallmatrix}8\,Cn\,R_{18}\,T\\ M\,T_{13}\,I\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001200	.000233	0.	....	
9, 000	36, 000	.001233	.000033	....	....	
9, 250	37, 000	.001300	.000067	....	....	
9, 500	38, 000	.001367	.000067	....	....	
9, 750	39, 000	.001433	.000066	....	....	Elastic limit.
10, 000	40, 000	.003233	.001800	....	....	
10, 250	41, 000	.006033	.002800	....	....	
10, 500	42, 000	.006900	.000867	....	....	
10, 750	43, 000	.007867	.000967	....	....	
11, 000	44, 000	.008800	.000933	....	....	
11, 250	45, 000	.009800	.001000	....	....	
11, 500	46, 000	.010733	.000933	....	....	
11, 750	47, 000	.012200	.001467	....	....	
12, 000	48, 000	.012767	.000567	....	....	
12, 250	49, 000	.013867	.001100	....	....	
12, 500	50, 000	.015067	.001200	....	....	
13, 000	52, 000	.017233	.002166	....	....	
13, 500	54, 000	.020067	.002834	....	....	
14, 000	56, 000	.022700	.002633	....	....	
14, 500	58, 000	.025667	.002967	....	....	
15, 000	60, 000	.029000	.003333	....	....	
15, 500	62, 000	.032667	.003667	....	....	
16, 000	64, 000	.036333	.003666	....	....	
16, 500	66, 000	.040733	.004400	....	....	
17, 000	68, 000	.046333	.005600	....	....	
17, 500	70, 000	.052333	.006000	....	....	
18, 000	72, 000	.0633	.010967	....	....	
18, 500	74, 000	.0700	.0067	....	....	
19, 000	76, 000	.0867	.0167	....	....	
19, 500	78, 000	.1067	.0200	....	....	
20, 000	80, 000	.1567	.0500	....	....	
20, 300	81, 200	.2000	.0433	....	....	Tensile strength

General summary.

Tensile strength per square inch of original section....................................pounds.. 81, 200
Elastic limit per square inch of original section...do.... 39, 000
Elongation per inch after rupture...inch.. 0. 2100
Elongation per inch under strain at elastic limit ....do.... .001433
Reduction in diameter at point of rupture..do.... .094
Reduction in area after rupture, per centum of original section 30. 6
Position of rupture ....1″.60 from neck
Character of broken surface ....granular; dull spot at the circumference
Elongation of inch sections.............................. ....″.19, ″.29*, ″.16

No. 2838.

Marks, $\overset{8\,C_{8}\,R_{18}\,T}{M\,T_{14}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000367	.000234	0.		
3,750	15,000	.000567	.000200	0.		
5,000	20,000	.000667	.000100	0.		
6,250	25,000	.000833	.000166	.000033	.000033	
7,500	30,000	.001000	.000167	.000033	.0	
8,750	35,000	.001200	.000200	.000033	.0	
9,000	36,000	.001233	.000033			
9,250	37,000	.001267	.000034			
9,500	38,000	.001300	.000033			
9,750	39,000	.001333	.000033			
10,000	40,000	.001367	.000034			
10,250	41,000	.001467	.000100			
10,500	42,000	.001500	.000033			
10,750	43,000	.001567	.000067			Elastic limit.
11,000	44,000	.001667	.000100			
11,250	45,000	.002400	.000733			
11,500	46,000	.004733	.002333			
11,750	47,000	.005100	.000367			
12,000	48,000	.006167	.001067			
12,250	49,000	.007000	.000833			
12,500	50,000	.008100	.001100			
13,000	52,000	.010433	.002333			
13,500	54,000	.012533	.002100			
14,000	56,000	.014867	.002334			
14,500	58,000	.017000	.002133			
15,000	60,000	.019367	.002367			
15,500	62,000	.022700	.003333			
16,000	64,000	.025333	.002633			
16,500	66,000	.029000	.003667			
17,000	68,000	.032667	.003667			
17,500	70,000	.036667	.004000			
18,000	72,000	.040700	.004033			
18,500	74,000	.047067	.006367			
19,000	76,000	.054333	.007266			
19,500	78,000	.0667	.012367			
20,000	80,000	.0733	.0066			
20,500	82,000	.0967	.0234			
21,000	84,000	.1567	.0600			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	84,000
Elastic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.2200
Elongation per inch under strain at elastic limit	do	.001567
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.75 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.12, ″.16, ″.38

No. 2839.

Marks, $\overset{8\ \mathrm{Cn}\ \mathrm{R}_{18}\ \mathrm{T}}{\mathrm{M}\ \mathrm{T}_{18}\ \mathrm{M}}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000833	.000200	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	.000033	.000033	
9, 000	36, 000	.001200	.000033	....	....	
9, 250	37, 000	.001267	.000067	....	....	
9, 500	38, 000	.001300	.000033	....	....	
9, 750	39, 000	.001333	.000033	....	....	
10, 000	40, 000	.001433	.000100	....	....	
10, 250	41, 000	.001467	.000034	....	....	
10, 500	42, 000	.001533	.000066	....	....	Elastic limit.
10, 750	43, 000	.002600	.001067	....	....	
11, 000	44, 000	.003700	.001100	....	....	
11, 250	45, 000	.005333	.001633	....	....	
11, 500	46, 000	.006233	.000900	....	....	
11, 750	47, 000	.007133	.000900	....	....	
12, 000	48, 000	.008067	.000934	....	....	
12, 250	49, 000	.009067	.001000	....	....	
12, 500	50, 000	.010133	.001066	....	....	
13, 000	52, 000	.012333	.002200	....	....	
13, 500	54, 000	.014367	.002034	....	....	
14, 000	56, 000	.016500	.002133	....	....	
14, 500	58, 000	.019033	.002533	....	....	
15, 000	60, 000	.021767	.002734	....	....	
15, 500	62, 000	.024367	.002600	....	....	
16, 000	64, 000	.027533	.003166	....	....	
16, 500	66, 000	.031000	.003467	....	....	
17, 000	68, 000	.034667	.003667	....	....	
17, 500	70, 000	.039267	.004600	....	....	
18, 000	72, 000	.044300	.005033	....	....	
18, 500	74, 000	.050333	.006033	....	....	
19, 000	76, 000	.0600	.009667	....	....	
19, 500	78, 000	.0667	.0067	....	....	
20, 000	80, 000	.0767	.0100	....	....	
20, 500	82, 000	.0967	.0200	....	....	
20, 900	83, 600	.1633	.0666	....	....	Tensile strength.

General summary.

Specific gravity		7. 8493
Hardness		14. 19
Tensile strength per square inch of original section	pounds..	83, 600
Elastic limit per square inch of original section	do	42, 000
Elongation per inch after rupture	inch..	0. 2100
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		''.70 from neck
Character of broken surface		silky
Elongation of inch sections		''.39*, ''.12, ''.11

No. 2823.

Marks, $^{8}\begin{smallmatrix}\text{Cn}\ \text{B}_{27}\ \text{T}\\ \text{M}\ \text{T}_{10}\ \text{I}\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000333	.000200	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	....	....	
9, 000	36, 000	.001200	.000033	....	....	
9, 250	37, 000	.001233	.000033	....	....	
9, 500	38, 000	.001267	.000034	....	....	
9, 750	39, 000	.001300	.000033	....	....	
10, 000	40, 000	.001333	.000033	....	....	
10, 250	41, 000	.001400	.000067	....	....	
10, 500	42, 000	.001500	.000100	....	....	
10, 750	43, 000	.001567	.000067	....	....	Elastic limit.
11, 000	44. 000	.002533	.000966	....	....	
11, 250	45, 000	.003500	.000967	....	....	
11, 500	46, 000	.004833	.001333	....	....	
11, 750	47, 000	.006167	.001334	....	....	
12, 000	48, 000	.007500	.001333	....	....	
12, 250	49, 000	.008667	.001167	....	....	
12, 500	50, 000	.009500	.000833	....	....	
13, 000	52, 000	.011333	.001833	....	....	
13, 500	54, 000	.013667	.002334	....	....	
14, 000	56, 000	.016333	.002666	....	....	
14, 500	58, 000	.018667	.002334	....	....	
15, 000	60, 000	.021333	.002666	....	....	
15, 500	62, 000	.023667	.002334	....	....	
16. 000	64, 000	.027000	.003333	....	....	
16, 500	66, 000	.030333	.003333	....	....	
17, 000	68, 000	.034000	.003667	....	....	
17, 500	70, 000	.038333	.004333	....	....	
18, 000	72, 000	.043667	.005334	....	....	
18, 500	74, 000	.0533	.009633	....	....	
19, 000	76, 000	.0600	.0067	....	....	
19, 500	78, 000	.0733	.0133	....	....	
20, 000	80, 000	.0900	.0167	....	....	
20, 400	81, 840	.1400	.0500	....	....	Tensile strength.

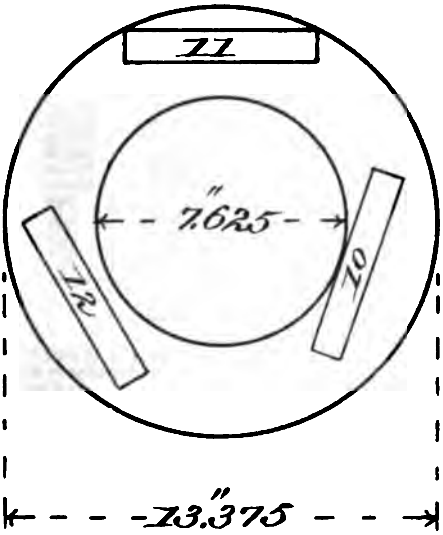
General summary.

Tensile strength per square inch of original section	pounds..	81, 840
Elastic limit per square inch of original section	do....	43, 000
Elongation per inch after rupture	inch..	0. 2000
Elongation per inch under strain at elastic limit	do....	.001567
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		⅜″ from neck
Character of broken surface		silky; developed fine cracks in surface of stem
Elongation of inch sections		″.12, ″.12, ″.25

8 inch converted Rifles

Tube No. 27

Muzzle



No. 2824.

Marks, $^{8\ \mathrm{Cn\ Bar\ T}}_{\mathrm{M\ T_{11}\ O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000600	.000133	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001100	.000133	....	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001200	.000067	....	....	
9,500	38,000	.001267	.000067	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	....	....	
10,250	41,000	.001333	0.	....	....	
10,500	42,000	.001400	.000067	....	....	Elastic limit.
10,750	43,000	.001767	.000367	....	....	
11,000	44,000	.003333	.001566	....	....	
11,250	45,000	.006333	.003000	....	....	
11,500	46,000	.007667	.001334	....	....	
11,750	47,000	.008333	.000666	....	....	
12,000	48,000	.009667	.001334	....	....	
12,250	49,000	.010333	.000666	....	....	
12,500	50,000	.011333	.001000	....	....	
13,000	52,000	.013333	.002000	....	....	
13,500	54,000	.015667	.002334	....	....	
14,000	56,000	.018333	.002666	....	....	
14,500	58,000	.020667	.002334	....	....	
15,000	60,000	.023333	.002666	....	....	
15,500	62,000	.026667	.003334	....	....	
16,000	64,000	.029667	.003000	....	....	
16,500	66,000	.033333	.003666	....	....	
17,000	68,000	.037333	.004000	....	....	
17,500	70,000	.042667	.005334	....	....	
18,000	72,000	.048333	.005666	....	....	
18,500	74,000	.056000	.007667	....	....	
19,000	76,000	.0667	.0107	....	....	
19,500	78,000	.0833	.0166	....	....	
20,000	80,000	.1167	.0334	....	....	
20,100	80,400	.1500	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 80,400
Elastic limit per square inch of original section..............................do.... 42,000
Elongation per inch after rupture..............................inch.. 0.1700
Elongation per inch under strain at elastic limit..............................do.... .001400
Reduction in diameter at point of rupture..............................do.... .004
Reduction in area after rupture, per centum of original section.............................. 30.6
Position of rupture..............................½″ from neck
Character of broken surface..............................granular; flaky spot at circumference
Diameter ″.15 from point of rupture..............................″.46
Elongation of inch sections..............................″.28*, ″.12, ″.11

No. 2825.

Marks, $^{8\ Cn\ Rw\ T}_{M\ T_{B}\ M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001300	.000067	....	....	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001467	.000100	....	....	Elastic limit.
11,000	44,000	.004667	.003200	....	....	
11,250	45,000	.006000	.001333	....	....	
11,500	46,000	.007000	.001000	....	....	
11,750	47,000	.007667	.000667	....	....	
12,000	48,000	.009000	.001333	....	....	
12,250	49,000	.010000	.001000	....	....	
12,500	50,000	.011000	.001000	....	....	
13,000	52,000	.013000	.002000	....	....	
13,500	54,000	.015333	.002333	....	....	
14,000	56,000	.017333	.002000	....	....	
14,500	58,000	.020000	.002667	....	....	
15,000	60,000	.023000	.003000	....	....	
15,500	62,000	.026000	.003000	....	....	
16,000	64,000	.029667	.003667	....	....	
16,500	66,000	.032667	.003000	....	....	
17,000	68,000	.036667	.004000	....	....	
17,500	70,000	.041333	.004666	....	....	
18,000	72,000	.047000	.005667	....	....	
18,500	74,000	.053333	.006333	....	....	
19,000	76,000	.0633	.009967	....	....	
19,500	78,000	.0767	.0134	....	....	
20,000	80,000	.1000	.0233	....	....	
20,340	81,360	.1500	.0500	....	....	Tensile strength.

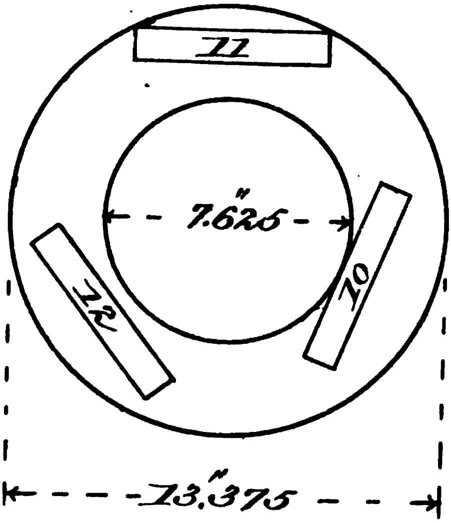
General summary.

Tensile strength per square inch of original section	pounds	81,360
Elastic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.2033
Elongation per inch under strain at elastic limit	do	.001467
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		[illegible]″ from middle of stem
Character of broken surface		granular, 70 per cent.; silky, 30 per cent.
Elongation of inch sections		″.19, ″.31*, ″.11

8 inch converted Rifles

New tube No. 44

Muzzle



No. 2826.

Marks, $^{8}\genfrac{}{}{0pt}{}{\text{Cn R}_{44}\text{ T}}{\text{M T}_{10}\text{ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000500	.000200	0.	....	
5,000	20,000	.000633	.000133	0.	....	
6,250	25,000	.000833	.000200	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001133	.000133	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001233	.000066	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	....	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001500	.000100	....	....	Elastic limit.
11,000	44,000	.002033	.000533	....	....	
11,250	45,000	.002700	.000667	....	....	
11,500	46,000	.005667	.002967	....	....	
11,750	47,000	.007033	.001366	....	....	
12,000	48,000	.008000	.000967	....	....	
12,250	49,000	.009000	.001000	....	....	
12,500	50,000	.009667	.000667	....	....	
13,000	52,000	.011667	.002000	....	....	
13,500	54,000	.014000	.002333	....	....	
14,000	56,000	.016333	.002333	....	....	
14,500	58,000	.018667	.002334	....	....	
15,000	60,000	.021667	.003000	....	....	
15,500	62,000	.024333	.002666	....	....	
16,000	64,000	.027000	.002667	....	....	
16,500	66,000	.030333	.003333	....	....	
17,000	68,000	.034333	.004000	....	....	
17,500	70,000	.038667	.004334	....	....	
18,000	72,000	.044000	.005333	....	....	
18,500	74,050	.050667	.006667	....	....	
19,000	76,000	.057667	.007000	....	....	
19,500	78,000	.0667	.009033	....	....	
20,000	80,000	.0867	.0200	....	....	
20,500	82,000	.1300	.0433	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	82,000
Elastic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.1667
Elongation per inch under strain at elastic limit	do	.001500
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		″.94 from neck
Character of broken surface		granular, flaky
Elongation of inch sections		″.18*, ″.18, ″.14

No. 2827.

Marks, $^{8\,\mathrm{Cn}\ \mathrm{R_{44}}\ \mathrm{T}}_{\mathrm{M}\ \mathrm{T_{11}}\ \mathrm{O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000933	.000133	0.	....	
8,750	35,000	.001100	.000167	....	....	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001167	0.	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	....	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001367	.000067	....	....	
10,750	43,000	.001433	.000066	....	....	
11,000	44,000	.001533	.000100	....	....	Elastic limit.
11,250	45,000	.003500	.001967	....	....	
11,500	46,000	.005833	.002333	....	....	
11,750	47,000	.006833	.001000	....	....	
12,000	48,000	.008000	.001167	....	....	
12,250	49,000	.009000	.001000	....	....	
12,500	50,000	.010333	.001333	....	....	
13,000	52,000	.012333	.002000	....	....	
13,500	54,000	.014333	.002000	....	....	
14,000	56,000	.017000	.002667	....	....	
14,500	58,000	.019333	.002333	....	....	
15,000	60,000	.022000	.002667	....	....	
15,500	62,000	.025000	.003000	....	....	
16,000	64,000	.028000	.003000	....	....	
16,500	66,000	.031667	.003667	....	....	
17,000	68,000	.035000	.003333	....	....	
17,500	70,000	.040000	.005000	....	....	
18,000	72,000	.045667	.005667	....	....	
18,500	74,000	.052333	.006666	....	....	
19,000	76,000	.0600	.007667	....	....	
19,500	78,000	.0767	.0167	....	....	
20,000	80,000	.1000	.0233	....	....	
20,260	81,040	.1433	.0433	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 81,040
Elastic limit per square inch of original section....................do.... 44,000
Elongation per inch after rupture....................inch.. 0.2300
Elongation per inch under strain at elastic limit....................do.... .001533
Reduction in diameter at point of rupture....................do.... .144
Reduction in area after rupture, per centum of original section.................... 44.6
Position of rupture....................1¼″ from neck
Character of broken surface....................silky
Elongation of inch sections....................″.30°, ″.26, ″.13

No. 2828.

Marks, $\substack{8\ \mathrm{Cn}\ \mathrm{R}_4\ \mathrm{T}\\ \mathrm{M}\ \mathrm{T}_{12}\ \mathrm{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	20,000	.001000	.000200	0.	....	
8,750	35,000	.001133	.000133	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001267	.000067	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001367	.000067	....	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001400	0.	....	....	Elastic limit.
10,750	43,000	.001533	.000133	....	....	
11,000	44,000	.003067	.001534	....	....	
11,250	45,000	.006833	.003766	....	....	
11,500	46,000	.007400	.000567	....	....	
11,750	47,000	.008400	.001000	....	....	
12,000	48,000	.009500	.001100	....	....	
12,250	49,000	.010667	.001167	....	....	
12,500	50,000	.012000	.001333	....	....	
13,000	52,000	.014333	.002333	....	....	
13,500	54,000	.016667	.002334	....	....	
14,000	56,000	.019000	.002333	....	....	
14,500	58,000	.021667	.002667	....	....	
15,000	60,000	.024667	.003000	....	....	
15,500	62,000	.028000	.003333	....	....	
16,000	64,000	.031333	.003333	....	....	
16,500	66,000	.035667	.004334	....	....	
17,000	68,000	.040000	.004333	....	....	
17,500	70,000	.045667	.005667	....	....	
18,000	72,000	.053333	.007666	....	....	
18,500	74,000	.0633	.009967	....	....	
19,000	76,000	.0767	.0134	....	....	
19,500	78,000	.0967	.0200	....	....	
20,000	80,000	.1400	.0433	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	80,000
Elastic limit per square inch of original section	do	42,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		½″ from middle of stem
Character of broken surface		silky; cracks in surface of stem
Elongation of inch sections		″.17, ″.89^4, ″.16

No. 2831.

Marks, $^{8}\,\text{Cn}\;\text{R}_{44}\;\text{T}$
$\text{M}\;\text{T}_{13}\;\text{I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	....	....	
2,500	10,000	.000300	.000133	....	....	
3,750	15,000	.000467	.000167	....	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000833	.000200	....	....	
7,500	30,000	.001033	.000200	0.	....	
8,750	35,000	.001200	.000167	....	....	
9,000	36,000	.001233	.000033	....	....	
9,250	37,000	.001267	.000034	....	....	
9,500	38,000	.001300	.000033	....	....	
9,750	39,000	.001333	.000033	....	....	
10,000	40,000	.001367	.000034	....	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001500	.000067	....	....	
11,000	44,000	.001533	.000033	....	....	
11,250	45,000	.001567	.000034	....	....	Elastic limit
11,500	46,000	.001733	.000166	....	....	
11,750	47,000	.003033	.001300	....	....	
12,000	48,000	.004533	.001500	....	....	
12,250	49,000	.006200	.001667	....	....	
12,500	50,000	.007533	.001333	....	....	
13,000	52,000	.009867	.002334	....	....	
13,500	54,000	.011867	.002000	....	....	
14,000	56,000	.014333	.002466	....	....	
14,500	58,000	.016667	.002334	....	....	
15,000	60,000	.019333	.002666	....	....	
15,500	62,000	.022000	.002667	....	....	
16,000	64,000	.025000	.003000	....	....	
16,500	66,000	.028333	.003333	....	....	
17,000	68,000	.032000	.003667	....	....	
17,500	70,000	.036667	.004667	....	....	
18,000	72,000	.041333	.004666	....	....	
18,500	74,000	.046667	.005334	....	....	
19,000	76,000	.054667	.008000	....	....	
19,500	78,000	.0700	.015333	....	....	
20,000	80,000	.0867	.0167	....	....	
20,500	82,000	.1267	.0400	....	....	
20,510	82,040	.1438	.0166	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	82,040
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.2067
Elongation per inch under strain at elastic limit	do....	.001567
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.8 from neck
Character of broken surface		granular, 60 per cent.; silky irregular surface, 40 per cent.
Elongation of inch sections		″.35*, ″.13, ″.14

No. 2832.

Marks, $^{8\,C.\,R_{41}\,T}_{M\,T_{14}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	....	....	
2,500	10,000	.000267	.000134	....	....	
3,750	15,000	.000433	.000166	....	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	....	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	....	....	
10,250	41,000	.001333	.000066	....	....	
10,500	42,000	.001400	.000067	....	....	
10,750	43,000	.001467	.000067	....	....	Elastic limit.
11,000	44,000	.003133	.001666	....	....	
11,250	45,000	.005300	.002167	....	....	
11,500	46,000	.006467	.001167	....	....	
11,750	47,000	.007467	.001000	....	....	
12,000	48,000	.008467	.001000	....	....	
12,250	49,000	.009133	.000666	....	....	
12,500	50,000	.010133	.001000	....	....	
13,000	52,000	.012467	.002334	....	....	
13,500	54,000	.014467	.002000	....	....	
14,000	56,000	.016800	.002333	....	....	
14,500	58,000	.019467	.002667	....	....	
15,000	60,000	.022133	.002666	....	....	
15,500	62,000	.025133	.003000	....	....	
16,000	64,000	.028467	.003334	....	....	
16,500	66,000	.031967	.003500	....	....	
17,000	68,000	.036133	.004166	....	....	
17,500	70,000	.041133	.005000	....	....	
18,000	72,000	.046800	.005667	....	....	
18,500	74,000	.053800	.007000	....	....	
19,000	76,000	.0667	.0129	....	....	
19,500	78,000	.0833	.0166	....	....	
20,000	80,000	.1033	.0200	....	....	
20,380	81,520	.1633	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 81,520
Elastic limit per square inch of original section..do.... 43,000
Elongation per inch after rupture... .. inch.. 0.2333
Elongation per inch under strain at elastic limit..do.... .001467
Reduction in diameter at point of rupture..do.... .094
Reduction in area after rupture, per centum of original section........................... 30.6
Position of rupture ....1″.1 from neck
Character of broken surface...................................granular; flaky spot at circumference
Elongation of inch sections...″.29*, ″.21, ″.20

No. 2833.

Marks, $^{8\ \mathrm{Cn}\ \mathrm{R}_{44}\ \mathrm{T}}_{\mathrm{M}\ \mathrm{T}_{15}\ \mathrm{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	....	....	
2,500	10,000	.000333	.000200	....	....	
3,750	15,000	.000500	.000167	....	....	
5,000	20,000	.000667	.000167	.000067	.000067	
6,250	25,000	.000800	.000133	....	....	
7,500	30,000	.001000	.000200	.000100	.000033	
8,750	35,000	.001133	.000133	....	....	
9,000	36,000	.001200	.000067	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	....	....	
10,250	41,000	.001433	.000100	....	....	
10,500	42,000	.001467	.000034	....	....	Elastic limit.
10,750	43,000	.001600	.000133	....	....	
11,000	44,000	.005133	.003533	....	....	
11,250	45,000	.006133	.00.000	....	....	
11,500	46,000	.007133	.001000	....	....	
11,750	47,000	.008133	.001000	....	....	
12,000	48,000	.009300	.001167	....	....	
12,250	49,000	.010133	.000833	....	....	
12,500	50,000	.011300	.001167	....	....	
13,000	52,000	.013467	.002167	....	....	
13,500	54,000	.015800	.002333	....	....	
14,000	56,000	.018133	.002333	....	....	
14 500	58,000	.020800	.002667	....	....	
15,000	60,000	.023800	.003000	....	....	
15,500	62,000	.026800	.003000	....	....	
16,000	64,000	.030467	.003667	....	....	
16,500	66,000	.034467	.004000	....	....	
17,000	68,000	.039133	.004666	....	....	
17,500	70,000	.044667	.005534	....	....	
18,000	72,000	.051333	.006666	....	....	
18,500	74,000	.0600	.008667	....	....	
19,000	76,000	.0733	.0133	....	....	
19,500	78,000	.0933	.0200	....	....	
19,900	79,600	.1700	.0767	....	....	Tensile strength.

General summary.

Specific gravity		7.8613
Hardness		14.90
Tensile strength per square inch of original section	pounds..	79,600
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.1833
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1″.5 from neck
Character of broken surface		granular; dull spot at the circumference
Elongation of inch sections		″.12, ″.27*, ″.16

No. 2862.

Marks, $^{8}{}^{\text{Cn R}_{4}\text{ T}}_{\text{M T}_{16}\text{ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000200	.000200	0.	....	
2,500	10,000	.000367	.000167	0.	....	
3,750	15,000	.000533	.000166	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000867	.000167	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	0.	....	
10,000	40,000	.001367	.000167	0.	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001533	.000066	....	....	
11,250	45,000	.001600	.000067	....	....	
11,500	46,000	.001700	.000100	....	....	Elastic limit.
11,750	47,000	.004000	.002300	....	....	
12,000	48,000	.006333	.002333	....	....	
12,250	49,000	.007267	.000934	....	....	
12,500	50,000	.008400	.001133	....	....	
13,000	52,000	.010733	.002333	....	....	
13,500	54,000	.013000	.002267	....	....	
14,000	56,000	.015367	.002367	....	....	
14,500	58,000	.018000	.002633	....	....	
15,000	60,000	.020600	.002600	....	....	
15,500	62,000	.023667	.003067	....	....	
16,000	64,000	.026667	.003000	....	....	
16,500	66,000	.030167	.003500	....	....	
17,000	68,000	.034167	.004000	....	....	
17,500	70,000	.038500	.004333	....	....	
18,000	72,000	.043667	.005167	....	....	
18,500	74,000	.0533	.009633	....	....	
19,000	76,000	.0600	.0067	....	....	
19,500	78,000	.0700	.0100	....	....	
20,000	80,000	.0900	.0200	....	....	
20,360	81,440	.1367	.0467	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	81,440
Elastic limit per square inch of original section	do	46,000
Elongation per inch after rupture	inch	0.2100
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.70 from neck
Character of broken surface		silky; opened fine cracks in surface of stem
Elongation of inch sections		″.37*, ″.14, ″.12

No. 2863.

Marks, $^{8\ Cn\ R_{44}\ T}_{M\ T_{17}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000533	.000200	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000900	.000200	0.	....	
7,500	30,000	.001067	.000167	0.	....	
8,750	35,000	.001233	.000166	0.	....	
10,000	40,000	.001433	.000200	.000033	.000033	
10,250	41,000	.001467	.000034	....	....	Elastic limit.
10,500	42,000	.001633	.000166	....	....	
10,750	43,000	.001900	.000267	....	....	
11,000	44,000	.002900	.001000	....	....	
11,250	45,000	.006000	.003100	....	....	
11,500	46,000	.007100	.001100	....	....	
11,750	47,000	.007700	.000600	....	....	
12,000	48,000	.008700	.001000	....	....	
12,250	49,000	.009467	.000767	....	....	
12,500	50,000	.010667	.001200	....	....	
13,000	52,000	.012867	.002200	....	....	
13,500	54,000	.015067	.002200	....	....	
14,000	56,000	.017400	.002333	....	....	
14,500	58,000	.020000	.002600	....	....	
15,000	60,000	.022900	.002900	....	....	
15,500	62,000	.026167	.003267	....	....	
16,000	64,000	.029000	.002833	....	....	
16,500	66,000	.032333	.003333	....	....	
17,000	68,000	.036533	.004200	....	....	
17,500	70,009	.041167	.004634	....	....	
18,000	72,000	.046667	.005500	....	....	
18,500	74,000	.0533	.006633	....	....	
19,000	76,000	.0633	.0100	....	....	
19,500	78,000	.0723	.0100	....	....	
20,000	80,000	.0967	.0234	....	....	
20,270	81,080	.1333	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	81,080
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section	...	36.4
Position of rupture		1″.12 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.32, ″.18, ″.10

No. 2864.

Marks, $^{8\,C_{8}\,R_{44}\,T}_{\;M\,T_{18}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000367	.000200	0.	....	
3,750	15,000	.000533	.000166	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000867	.000167	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	0.	....	
10,000	40,000	.001367	.000167	.000033	.000033	
10,250	41,000	.001400	.000033	....	....	Elastic limit.
10,500	42,000	.001500	.000100	....	....	
10,750	43,000	.001800	.000300	....	....	
11,000	44,000	.005167	.003367	....	....	
11,250	45,000	.006567	.001400	....	....	
11,500	46,000	.007433	.000866	....	....	
11,750	47,000	.008267	.000834	....	....	
12,000	48,000	.009567	.001300	....	....	
12,250	49,000	.010333	.000766	....	....	
12,500	50,000	.011467	.001134	....	....	
13,000	52,000	.013600	.002133	....	....	
13,500	54,000	.016200	.002600	....	....	
14,000	56,000	.018667	.002467	....	....	
14,500	58,000	.021333	.002666	....	....	
15,000	60,000	.024000	.002667	....	....	
15,500	62,000	.027167	.003167	....	....	
16,000	64,000	.030667	.003500	....	....	
16,500	66,000	.034833	.004166	....	....	
17,000	68,000	.039167	.004334	....	....	
17,500	70,000	.044000	.004833	....	....	
18,000	72,000	.0500	.0060	....	....	
18,500	74,000	.0600	.0100	....	....	
19,000	76,000	.0700	.0100	....	....	
19,500	78,000	.0900	.0200	....	....	
19,960	79,840	.1433	.0533	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	79,840
Elastic limit per square inch of original section	do ...	41,000
Elongation per inch after rupture	inch..	0.2167
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″ from neck
Character of broken surface		silky; slightly granular; opened cracks in surface of stem
Elongation of inch sections		″.12, ″.20, ″.33*

No. 2865.

Marks, $^{8\ \mathrm{Cn\ R_4\ T}}_{\mathrm{M\ T_p\ M.}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000367	.000200	0.	....	
3, 750	15, 000	.000567	.000200	0.	....	
5, 000	20, 000	.000733	.000166	0.	....	
6, 250	25, 000	.000900	.000167	0.	....	
7, 500	30, 000	.001100	.000200	0.	....	
8, 750	35, 000	.001233	.000133	0.	....	
10, 000	40, 000	.001433	.000200	.000033	.000033	
10, 250	41, 000	.001467	.000034	....	....	
10, 500	42, 000	.001533	.000066	....	....	
10, 750	43, 000	.001600	.000067	....	....	Elastic limit.
11, 000	44, 000	.001800	.000200	....	....	
11, 250	45, 000	.005500	.003700	....	....	
11, 500	46, 000	.006767	.001267	....	....	
11, 750	47, 000	.007833	.001066	....	....	
12, 000	48, 000	.008833	.001000	....	....	
12, 250	49, 000	.009867	.001034	....	....	
12, 500	50, 000	.010933	.001066	....	....	
13, 000	52, 000	013067	.002134	....	....	
13, 500	54, 000	.015333	.002266	....	....	
14, 000	56, 000	.017733	.002400	....	....	
14, 500	58, 000	.020400	.002667	....	....	
15, 000	60, 000	.023333	.002933	....	....	
15, 500	62, 000	.026267	.002934	....	....	
16, 000	64, 000	.029333	.003066	....	....	
16, 500	66, 000	.033667	.004334	....	....	
17, 000	68, 000	.038333	.004666	....	....	
17, 500	70, 000	.043000	.004667	....	....	
18, 000	72, 000	.049667	.006667	....	....	
18, 500	74, 000	.060667	.011000	....	....	
19, 000	76, 000	.0700	.009333	....	....	
19, 500	78, 000	.0833	.0133	....	....	
20, 000	80, 000	.1100	.0267	....	....	
20, 040	80, 160	.1367	.0267	....	....	Tensile strength.

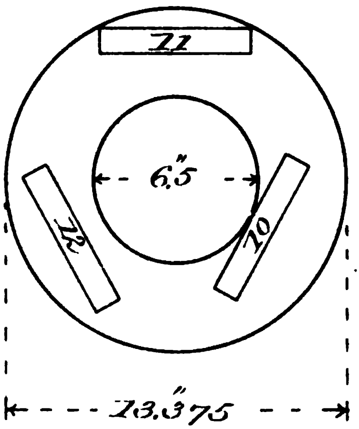
General summary.

Tensile strength per square inch of original section	pounds	80, 160
Elastic limit per square inch of original section	do	43, 000
Elongation per inch after rupture	inch	0. 1967
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36. 4
Position of rupture		1″.70 from neck
Character of broken surface		silky; trace of granulation; opened cracks in surface of stem
Elongation of inch sections		″.12, ″.34*, ″.13

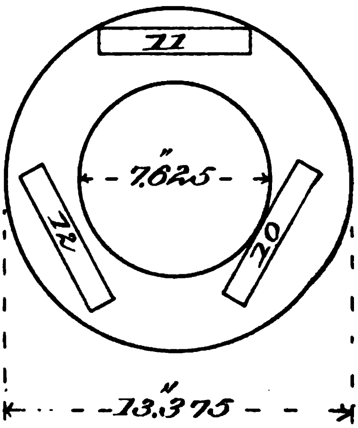
8 inch converted Rifles

New tube No. 50

Breech



Muzzle



No. 2880.

Marks, $^{8}\begin{smallmatrix}\text{Cn R}_{20}\text{ T}\\ \text{B T}_{18}\text{ I}\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000300	.000133	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	....	....	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001300	.000067	....	....	
9,750	39,000	.001333	.000033	....	....	
10,000	40,000	.001367	.000034	....	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001467	.000067	....	....	
10,750	43,000	.001500	.000033	....	....	Elastic limit.
11,000	44,000	.011333	.009833	....	....	
11,250	45,000	.012067	.000734	....	....	
11,500	46,000	.013000	.000933	....	....	
11,750	47,000	.013900	.000900	....	....	
12,000	48,000	.015567	.001667	....	....	
12,250	49,000	.016567	.001000	....	....	
12,500	50,000	.018100	.001533	....	....	
13,000	52,000	.020767	.002667	....	....	
13,500	54,000	.023733	.002966	....	....	
14,000	56,000	.027233	.003500	....	....	
14,500	58,000	.031367	.004134	....	....	
15,000	60,000	.035667	.004300	....	....	
15,500	62,000	.041333	.005666	....	....	
16,000	64,000	.046667	.005334	....	....	
16,500	66,000	.052667	.006000	....	....	
17,000	68,000	.0600	.007333	....	....	
17,500	70,000	.0733	.0133	....	....	
18,000	72,000	.0900	.0167	....	....	
18,500	74,000	.1267	.0367	....	....	
18,570	74,280	.1600	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	74,280
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.16, ″.40*

No. 2881.

Marks, $^{8}\substack{\text{Cn R T} \\ \text{B T}_{11}\text{ O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001233	.000066	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001367	.000067	....	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	Elastic limit.
10,750	43,000	.001567	.000134	....	....	
11,000	44,000	.008000	.006433	....	....	
11,250	45,000	.009000	.001000	....	....	
11,500	46,000	.009833	.000833	....	....	
11,750	47,000	.010700	.000867	....	....	
12,000	48,000	.012100	.001400	....	....	
12,250	49,000	.012900	.000800	....	....	
12,500	50,000	.014167	.001267	....	....	
13,000	52,000	.016567	.002400	....	....	
13,500	54,000	.019500	.002933	....	....	
14,000	56,000	.022167	.002667	....	....	
14,500	58,000	.025000	.002833	....	....	
15,000	60,000	.028333	.003333	....	....	
15,500	62,000	.031900	.003567	....	....	
16,000	64,000	.035833	.003933	....	....	
16,500	66,000	.040733	.004900	....	....	
17,000	68,000	.046167	.005434	....	....	
17,500	70,000	.053033	.006866	....	....	
18,000	72,000	.061667	.008634	....	....	
18,500	74,000	.0700	.008333	....	....	
19,000	76,000	.0933	.0233	....	....	
19,500	78,000	.1333	.0400	....	....	
19,580	78,320	.1633	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	78,320
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.2433
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		1″.40 from neck
Character of broken surface		silky
Elongation of inch sections		″.21, ″.40*, ″.12

No 2882.

Marks, $^{8}\genfrac{}{}{0pt}{}{\text{Cn R}_{60}\text{ T}}{\text{B T}_{12}\text{ M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000467	.000134	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000833	.000200	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167			
9,000	36,000	.001200	.000033			
9,250	37,000	.001233	.000033			
9,500	38,000	.001300	.000067			
9,750	39,000	.001333	.000033			
10,000	40,000	.001367	.000034			
10,250	41,000	.001400	.000033			
10,500	42,000	.001433	.000033			Elastic limit.
10,750	43,000	.013567	.012134			
11,000	44,000	.015200	.001633			
11,250	45,000	.016500	.001300			
11,500	46,000	.017667	.001167			
11,750	47,000	.019500	.001833			
12,000	48,000	.021000	.001500			
12,250	49,000	.022167	.001167			
12,500	50,000	.023733	.001566			
13,000	52,000	.027233	.003500			
13,500	54,000	.031000	.003767			
14,000	56,000	.035333	.004333			
14,500	58,000	.040067	.004734			
15,000	60,000	.046000	.005933			
15,500	62,000	.053333	.007333			
16,000	64,000	.062000	.008667			
16,500	66,000	.0733	.0113			
17,000	68,000	.0900	.0167			
17,500	70,000	.1167	.0267			
17,920	71,680	.1800	.0633			Tensile strength.

General summary.

Specific gravity		7.8566
Hardness		11.65
Tensile strength per square inch of original section	pounds..	71,680
Elastic limit per square inch of original section	do ...	42,000
Elongation per inch after rupture	inch .	0.2867
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.194
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		1″.70 from neck
Character of broken surface		silky
Elongation of inch sections		″.16, ″.48*, ″.22

No. 2883.

Marks, ^{8}Cn R$_{80}$ T
M T$_{10}$ I
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.000967	.000134	0.	....	
8,750	35,000	.001133	.000166	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001267	.000067	....	....	
9,750	39,000	.001333	.000066	....	....	
10,000	40,000	.001400	.000067	....	....	
10,250	41,000	.001400	0.	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001567	.000067	....	....	Elastic limit.
11,500	46,000	.001833	.000266	....	....	
11,750	47,000	.002333	.000500	....	....	
12,000	48,000	.004200	.001867	....	....	
12,250	49,000	.005233	.001033	....	....	
12,500	50,000	.006733	.001500	....	....	
13,000	52,000	.008700	.001967	....	....	
13,500	54,000	.010700	.002000	....	....	
14,000	56,000	.013000	.002300	....	....	
14,500	58,000	.015333	.002333	....	....	
15,000	60,000	.018000	.002677	....	....	
15,500	62,000	.020000	.002000	....	....	
16,000	64,000	.022667	.002667	....	....	
16,500	66,000	.025400	.002733	....	....	
17,000	68,000	.028667	.003267	....	....	
17,500	70,000	.032500	.003833	....	....	
18,000	72,000	.036333	.003833	....	....	
18,500	74,000	.040733	.004400	....	....	
19,000	76,000	.046333	.005600	....	....	
19,500	78,000	.052900	.006567	....	....	
20,000	80,000	.0633	.0104	....	....	
20,500	82,000	.0733	.0100	....	....	
21,000	84,000	.1000	.0267	....	....	
21,120	84,480	.1300	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	84,480
Elastic limit per square inch of original section	do	45,000
Elongation per inch after rupture	inch	0.1433
Elongation per inch under strain at elastic limit	do	.001567
Reduction in diameter at point of rupture	do	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		[illegible]″ from neck
Character of broken surface		granular, 80 per cent.; dull, flaky, 20 per cent.
Elongation of inch sections		″.09, ″.13, ″.21

No. 2884.

Marks, $\overset{8\ \mathrm{Cu\ R_{60}\ T}}{\mathrm{M\ T_{11}\ O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000867	.000200	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	....	....	
10,000	40,000	.001400	.000200	....	....	
10,250	41,000	.001467	.000067	....	....	
10,500	42,000	.001567	.000100	....	....	
10,750	43,000	.001633	.000066	....	....	Elastic limit.
11,000	44,000	.002333	.000700	....	....	
11,250	45,000	.004000	.001667	....	....	
11,500	46,000	.005333	.001333	....	....	
11,750	47,000	.006067	.000734	....	....	
12,000	48,000	.007333	.001266	....	....	
12,250	49,000	.008233	.000900	....	....	
12,500	50,000	.009100	.000867	....	....	
13,000	52,000	.011167	.002067	....	....	
13,500	54,000	.013167	.002000	....	....	
14,000	56,000	.015333	.002166	....	....	
14,500	58,000	.017400	.002067	....	....	
15,000	60,000	.019833	.002433	....	....	
15,500	62,000	.022167	.002334	....	....	
16,000	64,000	.025000	.002833	....	....	
16,500	66,000	.027833	.002833	....	....	
17,000	68,000	.031333	.003500	....	....	
17,500	70,000	.035000	.003667	....	....	
18,000	72,000	.038667	.003667	....	....	
18,500	74,000	.041000	.002333	....	....	
19,000	76,000	.049667	.008667	....	....	
19,500	78,000	.0567	.007033	....	....	
20,000	80,000	.0667	.0100	....	....	
20,500	82,000	.0800	.0133	....	....	
21,000	84,000	.1067	.0267	....	....	
21,080	84,320	.1267	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 84,320
Elastic limit per square inch of original section....................................do.... 43,000
Elongation per inch after rupture....................................inch.. 0.1767
Elongation per inch under strain at elastic limit....................................do.... .001633
Reduction in diameter at point of rupture....................................do.... .104
Reduction in area after rupture, per centum of original section.................................... 33.5
Position of rupture....................................1″.40 from neck
Character of broken surface....................................granular; silky spot at the circumference
Elongation of inch sections....................................″.10, ″.26*, ″.17

No. 2885.

Marks, 8 Cn R$_{60}$ T
M.T$_{12}$ M
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000633	.000133	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001300	.000100	....	....	
9,750	39,000	.001367	.000067	....	....	
10,000	40,000	.001400	.000033	....	....	
10,250	41,000	.001433	.000033	....	....	Elastic limit.
10,500	42,000	.002400	.000967	....	....	
10,750	43,000	.003833	.001433	....	....	
11,000	44,000	.005667	.001834	....	....	
11,250	45,000	.006667	.001000	....	....	
11,500	46,000	.007833	.001166	....	....	
11,750	47,000	.008667	.000834	....	....	
12,000	48,000	.009700	.001033	....	....	
12,250	49,000	.010667	.000967	....	....	
12,500	50,000	.011733	.001066	....	....	
13,000	52,000	.013733	.002000	....	....	
13,500	54,000	.016000	.002267	....	....	
14,000	56,000	.018367	.002367	....	....	
14,500	58,000	.021000	.002633	....	....	
15,000	60,000	.024000	.003000	....	....	
15,500	62,000	.027000	.003000	....	....	
16,000	64,000	.030000	.003000	....	....	
16,500	66,000	.033667	.003667	....	....	
17,000	68,000	.037500	.003833	....	....	
17,500	70,000	.042333	.004833	....	....	
18,000	72,000	.048000	.005667	....	....	
18,500	74,000	.055000	.007000	....	....	
19,000	76,000	.0633	.0083	....	....	
19,500	78,000	.0733	.0100	....	....	
20,000	80,000	.0967	.0234	....	....	
20,360	81,440	.1433	.0466	....	....	Tensile strength.

General summary.

Specific gravity		7.8550
Hardness		14.54
Tensile strength per square inch of original section	pounds	81,440
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.2133
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1" from neck
Character of broken surface		silky
Elongation of inch sections		".36*, ".17, ".12

No. 3013.

Marks, $^{8}\,\mathrm{Cn}\;\mathrm{R}_{80}\;\mathrm{T}$
$\mathrm{B}\;\mathrm{T}_{18}\;\mathrm{I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000300	.000133	0.	....	
3, 750	15, 000	.000500	.000200	0.	....	
5, 000	20, 000	.000700	.000200	0.	....	
6, 250	25, 000	.000900	.000200	0.	....	
7, 500	30, 000	.001033	.000133	0.	....	
8, 750	35, 000	.001200	.000167	....	....	
9, 000	36, 000	.001233	.000033	....	....	
9, 250	37, 000	.001267	.000034	....	....	
9, 500	38, 000	.001333	.000066	....	....	
9, 750	39, 000	.001367	.000034	....	....	
10, 000	40, 000	.001433	.000066	....	....	
10, 250	41, 000	.001500	.000067	....	....	
10, 500	42, 000	.001533	.000033	....	....	Elastic limit.
10, 750	43, 000	.003667	.002134	....	....	
11, 000	44, 000	.006667	.003000	....	....	
11, 250	45, 000	.007667	.001000	....	....	
11, 500	46, 000	.008667	.001000	....	....	
11, 750	47, 000	.009500	.000833	....	....	
12, 000	48, 000	.010667	.001167	....	....	
12, 250	49, 000	.011567	.000900	....	....	
12, 500	50, 000	.012900	.001333	....	....	
13, 000	52, 000	.015333	.002433	....	....	
13, 500	54, 000	.017667	.001334	....	....	
14, 000	56, 000	.020400	.002733	....	....	
14, 500	58, 000	.023167	.002767	....	....	
15, 000	60, 000	.026367	.003200	....	....	
15, 500	62, 000	.029667	.003300	....	....	
16, 000	64, 000	.033067	.003400	....	....	
16, 500	66, 000	.037667	.004600	....	....	
17, 000	68, 000	.042267	.004600	....	....	
17, 500	70, 000	.0467	.004433	....	....	
18, 000	72, 000	.0533	.0066	....	....	
18, 500	74, 000	.0633	.0100	....	....	
19, 000	76, 000	.0733	.0100	....	....	
19, 500	78, 000	.0967	.0234	....	....	
19, 960	79, 840	.1533	.0566	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	79, 840
Elastic limit per square inch of original section	do ...	42, 000
Elongation per inch after rupture	inch..	0. 2267
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.174
•Reduction in area after rupture, per centum of original section		52. 2
Position of rupture		″.95 from neck
Character of broken surface		silky. Opened cracks in surface of stem
Elongation of inch sections		″.11, ″.17, ″.40•

No. 3014.

Marks, $^{8\ \mathrm{Cn}\ \mathrm{R_{ss}}\ \mathrm{T}}_{\mathrm{B}\ \mathrm{T_{14}}\ \mathrm{O}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166			
9,000	36,000	.001167	.000034			
9,250	37,000	.001200	.000033			
9,500	38,000	.001267	.000067			
9,750	39,000	.001300	.000033			
10,000	40,000	.001333	.000033			
10,250	41,000	.001400	.000067			
10,500	42,000	.001433	.000033			
10,750	43,000	.001500	.000067			
11,000	44,000	.001567	.000067			Elastic limit.
11,250	45,000	.005500	.003933			
11,500	46,000	.006500	.001000			
11,750	47,000	.007667	.001167			
12,000	48,000	.008667	.001000			
12,250	49,000	.009500	.000833			
12,500	50,000	.010433	.000933			
13,000	52,000	.012600	.002167			
13,500	54,000	.014733	.002133			
14,000	56,000	.017233	.002500			
14,500	58,000	.019667	.002434			
15,000	60,000	.022667	.003000			
15,500	62,000	.025167	.002500			
16,000	64,000	.028333	.003166			
16,500	66,000	.031833	.003500			
17,000	68,000	.036000	.004167			
17,500	70,000	.040000	.004000			
18,000	72,000	.0433	.0033			
18,500	74,000	.0500	.0067			
19,000	76,000	.0567	.0067			
19,500	78,000	.0700	.0133			
20,000	80,000	.0867	.0167			
20,500	82,000	.1167	.0300			
20,580	82,320	.1567	.0400			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	82,320
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001567
Reduction in diameter at point of rupture	do	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		1".42 from neck
Character of broken surface		silky
Elongation of inch sections		".13, ".39*, ".20

No. 3015.

Marks, $\begin{array}{c}8\ \mathrm{Cn}\ \mathrm{R}_{30}\ \mathrm{T}\\ \mathrm{B}\ \mathrm{T}_{15}\ \mathrm{M}\end{array}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001367	.000100	....	....	
10,250	41,000	.001433	.000066	....	....	Elastic limit.
10,500	42,000	.006400	.004967	....	....	
10,750	43,000	.007067	.000667	....	....	
11,000	44,000	.008333	.001266	....	....	
11,250	45,000	.009000	.000667	....	....	
11,500	46,000	.010100	.001100	....	....	
11,750	47,000	.011000	.000900	....	....	
12,000	48,000	.012267	.001267	....	....	
12,250	49,000	.013333	.001066	....	....	
12,500	50,000	.014500	.001167	....	....	
13,000	52,000	.017000	.002500	....	....	
13,500	54,000	.019667	.002667	....	....	
14,000	56,000	.022667	.003000	....	....	
14,500	58,000	.025500	.002833	....	....	
15,000	60,000	.028667	.003167	....	....	
15,500	62,000	.032500	.003833	....	....	
16,000	64,000	.036500	.004000	....	....	
16,500	66,000	.041333	.004833	....	....	
17,000	68,000	.0450	.003667	....	....	
17,500	70,000	.0567	.0117	....	....	
18,000	72,000	.0633	.0066	....	....	
18,500	74,000	.0733	.0100	....	....	
19,000	76,000	.0900	.0167	....	....	
19,500	78,000	.1333	.0433	....	....	
19,510	78,040	.1767	.0434	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	78,040
Elastic limit per square inch of original section ....do....	41,000
Elongation per inch after rupture ....inch..	0.2567
Elongation per inch under strain at elastic limit ....do....	.001433
Reduction in diameter at point of rupture ....do ...	.184
Reduction in area after rupture, per centum of original section	54.6
Position of rupture	1''.48 from neck
Character of broken surface	silky
Elongation of inch sections	''.19, ''.43*, ''.15

No. 3016.

Marks, $^{8\ \mathrm{Cn}\ \mathrm{R}_{56}\ \mathrm{T}}_{\mathrm{M}\ \mathrm{T}_{12}\ \mathrm{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000867	.000200	.000033	.000033	
7,500	30,000	.001067	.000200	.000067	.000034	
8,750	35,000	.001233	.000166	....	....	
9,000	36,000	.001267	.000034	....	....	
9,250	37,000	.001300	.000033	....	....	
9,500	38,000	.001367	.000067	....	....	
9,750	39,000	.001400	.000033	....	....	
10,000	40,000	.001467	.000067	....	....	
10,250	41,000	.001500	.000033	....	....	
10,500	42,000	.001567	.000067	....	....	
10,750	43,000	.001633	.000066	....	....	Elastic limit.
11,000	44,000	.001900	.000267	....	....	
11,250	45,000	.002200	.000300	....	....	
11,500	46,000	.002467	.000267	....	....	
11,750	47,000	.004700	.002233	....	....	
12,000	48,000	.000000	.001300	....	....	
12,250	49,000	.006867	.000867	....	....	
12,500	50,000	.008033	.001166	....	....	
13,000	52,000	.010033	.002000	....	....	
13,500	54,000	.012333	.002300	....	....	
14,000	56,000	.014667	.002334	....	....	
14,500	58,000	.016500	.001833	....	....	
15,000	60,000	.019333	.002833	....	....	
15,500	62,000	.021333	.002000	....	....	
16,000	64,000	.023900	.002567	....	....	
16,500	66,000	.026667	.002767	....	....	
17,000	68,000	.029833	.003166	....	....	
17,500	70,000	.033333	.003500	....	....	
18,000	72,000	.037833	.004500	....	....	
18,500	74,000	.042000	.004167	....	....	
19,000	76,000	.0467	.0047	....	....	
19,500	78,000	.0533	.0066	....	....	
20,000	80,000	.0633	.0100	....	....	
20,500	82,000	.0733	.0100	....	....	
21,000	84,000	.0967	.0234	....	....	
21,290	85,160	.1333	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85,160
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	.001633
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		1″.55 from neck
Character of broken surface		dull flaky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		″.10, ″.20*, ″.13

No. 3017.

Marks, $\overset{\text{8 On Rs T}}{\text{M T}_{14}\text{ O}}$
Diameter, ".565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	....	....	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001333	.000100	....	....	
9,750	39,000	.001367	.000034	....	....	
10,000	40,000	.001400	.000033	....	....	Elastic limit.
10,250	41,000	.001500	.000100	....	....	
10,500	42,000	.004000	.002500	....	....	
10,750	43,000	.005767	.001767	....	....	
11,000	44,000	.007000	.001233	....	....	
11,250	45,000	.007867	.000867	....	....	
11,500	46,000	.008733	.000866	....	....	
11,750	47,000	.009667	.000934	....	....	
12,000	48,000	.011000	.001333	....	....	
12,250	49,000	.011667	.000667	....	....	
12,500	50,000	.013000	.001333	....	....	
13,000	52,000	.015167	.002167	....	....	
13,500	54,000	.017567	.002400	....	....	
14,000	56,000	.020567	.003000	....	....	
14,500	58,000	.023333	.002766	....	....	
15,000	60,000	.026500	.003167	....	....	
15,500	62,000	.030000	.003500	....	....	
16,000	64,000	.033667	.003667	....	....	
16,500	66,000	.036833	.003166	....	....	
17,000	68,000	.041667	.004834	....	....	
17,500	70,000	.047167	.005500	....	....	
18,000	72,000	.0533	.006133	....	....	
18,500	74,000	.0633	.0100	....	....	
19,000	76,000	.0733	.0100	....	....	
19,500	78,000	.0933	.0200	....	....	
19,930	79,720	.1467	.0534	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	79,720
Elastic limit per square inch of original section	do	40,000
Elongation per inch after rupture	inch	0.2233
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.165
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1".10 from neck
Character of broken surface		silky
Elongation of inch sections		".32*, ".23, ".12

No. 3018.

Marks, $\begin{smallmatrix}8\ \mathrm{Cn}\ \mathrm{R}_{60}\ \mathrm{T}\\ \mathrm{M}\ \mathrm{T}_{15}\ \mathrm{M}\end{smallmatrix}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001133	.000166	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001233	.000066	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001367	.000067	....	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	Elastic limit.
10,750	43,000	.001600	.000167	....	....	
11,000	44,000	.004033	.002433	....	....	
11,250	45,000	.004933	.000900	....	....	
11,500	46,000	.006000	.001067	....	....	
11,750	47,000	.007033	.001033	....	....	
12,000	48,000	.008067	.001034	....	....	
12,250	49,000	.009000	.000933	....	....	
12,500	50,000	.010067	.001067	....	....	
13,000	52,000	.012033	.001966	....	....	
13,500	54,000	.014333	.002300	....	....	
14,000	56,000	.016367	.002034	....	....	
14,500	58,000	.019000	.002633	....	....	
15,000	60,000	.021667	.002667	....	....	
15,500	62,000	.024367	.002700	....	....	
16,000	64,000	.027500	.003133	....	....	
16,500	66,000	.031000	.003500	....	....	
17,000	68,000	.034267	.003267	....	....	
17,500	70,000	.038833	.004566	....	....	
18,000	72,000	.043333	.004500	....	....	
18,500	74,000	.049000	.005667	....	....	
19,000	76,000	.0567	.0077	....	....	
19,500	78,000	.0667	.0100	....	....	
20,000	80,000	.0800	.0133	....	....	
20,500	82,000	.1033	.0233	....	....	
20,710	82,840	.1400	.0367	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	82,840
Elastic limit per square inch of original section	do	42,000
Elongation per inch after rupture	inch..	0 .2267
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1''.35 from neck
Character of broken surface		silky
Elongation of inch sections		''.23, ''.34*, ''.11

No. 3086.

Marks, $^{8}\genfrac{}{}{0pt}{}{\mathrm{Cn\ R_{80}\ T}}{\mathrm{M\ T_{16}\ I}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000467	.000200	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000767	.000100	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
10,000	40,000	.001267	.000167	....	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001367	.000067	....	....	
10,750	43,000	.001433	.000066	....	....	Elastic limit.
11,000	44,000	.002733	.001300	....	....	
11,250	45,000	.003433	.000700	....	....	
11,500	46,000	.005767	.002334	....	....	
11,750	47,000	.006567	.000800	....	....	
12,000	48,000	.007733	.001166	....	....	
12,250	49,000	.008667	.000934	....	....	
12,500	50,000	.009933	.001266	....	....	
13,000	52,000	.012167	.002234	....	....	
13,500	54,000	.014267	.002100	....	....	
14,000	56,000	.016667	.002400	....	....	
14,500	58,000	.019167	.002500	....	....	
15,000	60,000	.022000	.002833	....	....	
15,500	62,000	.024783	.002783	....	....	
16,000	64,000	.028033	.003300	....	....	
16,500	66,000	.031500	.003467	....	....	
17,000	68,000	.035333	.003833	....	....	
17,500	70,000	.040000	.004667	....	....	
18,000	72,000	.045367	.005367	....	....	
18,500	74,000	.051833	.006466	....	....	
19,000	76,000	.0600	.008167	....	....	
19,500	78,000	.0700	.0100	....	....	
20,000	80,000	.0900	.0200	....	....	
20,500	82,000	.1300	.0400	....	....	
20,550	82,200	.1600	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	82,200
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2067
Elongation per inch under strain of elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		".75 from neck
Character of broken surface		silky; trace of granulation. Opened small cracks in surface of stem
Elongation of inch sections		".32*, ".16, ".14

No. 3087.

Marks, $^{8\ \mathrm{Cn\ R_{66}\ T}}_{\ \ \mathrm{M\ T_{17}\ O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001167	0.	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001267	.000067	....	....	
10,000	40,000	.001300	.000033	....	....	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	Elastic limit.
11,000	44,000	.001633	.000233	....	....	
11,250	45,000	.002167	.000534	....	....	
11,500	46,000	.005167	.003000	....	....	
11,750	47,000	.006333	.001166	....	....	
12,000	48,000	.007333	.001000	....	....	
12,250	49,000	.007833	.000500	....	....	
12,500	50,000	.008667	.000834	....	....	
13,000	52,000	.010433	.001766	....	....	
13,500	54,000	.012500	.002067	....	....	
14,000	56,000	.014533	.002033	....	....	
14,500	58,000	.016833	.002300	....	....	
15,000	60,000	.019333	.002500	....	....	
15,500	62,000	.021667	.002334	....	....	
16,000	64,000	.024000	.002333	....	....	
16,500	66,000	.026833	.002833	....	....	
17,000	68,000	.029867	.003034	....	....	
17,500	70,000	.033833	.003966	....	....	
18,000	72,000	.037533	.003700	....	....	
18,500	74,000	.041700	.004167	....	....	
19,000	76,000	.047333	.005633	....	....	
19,500	78,000	.054333	.007000	....	....	
20,000	80,000	.061667	.007334	....	....	
20,500	82,000	.0733	.011633	....	....	
21,000	84,000	.0900	.0167	....	....	
21,440	85,760	.1433	.0533	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85,760
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2033
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1″.40 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.29*, ″.20

No. 3088.

Marks, $\begin{smallmatrix}8\,\mathrm{Cn}\,\mathrm{R}_{86}\,\mathrm{T}\\ \mathrm{M}\,\mathrm{T}_{18}\,\mathrm{M}\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	....	....	
9, 000	36, 000	.001200	.000033	....	....	
9, 250	37. 000	.001233	.000033	....	....	
9, 500	38, 000	.001300	.000067	....	....	
9, 750	39, 000	.001300	0.	....	....	
10, 000	40, 000	.001333	.000033	....	....	
10, 250	41, 000	.001367	.000034	....	....	Elastic limit.
10, 500	42, 000	.001467	.000100	....	....	
10, 750	43, 000	.005000	.003533	....	....	
11, 000	44, 000	.006167	.001167	....	....	
11, 250	45, 000	.007033	.000866	....	....	
11, 500	46, 000	.008033	.001000	....	....	
11, 750	47, 000	.008833	.000800	....	....	
12, 000	48, 000	.009900	.001067	....	....	
12, 250	49, 000	.011000	.001100	....	....	
12, 500	50, 000	.012000	.001000	....	....	
13, 000	52, 000	.014333	.002333	....	....	
13, 500	54, 000	.016500	.002167	....	....	
14. 000	56, 000	.019000	.002500	....	....	
14, 500	58, 000	.022333	.003333	....	....	
15, 000	60, 000	.025000	.002667	....	....	
15, 500	62, 000	.028000	.003000	....	....	
16, 000	64, 000	.030833	.002833	....	....	
16, 500	66, 000	.034200	.003367	....	....	
17, 000	68, 000	.038267	.004067	....	....	
17, 500	70, 000	.043900	.005633	....	....	
18, 000	72, 000	.048333	.004433	....	....	
18, 500	74, 000	.0551	.006767	....	....	
19, 000	76, 000	.0667	.0116	....	....	
19, 500	78, 000	.0767	.0100	....	....	
20, 000	80, 00	.0967	.0200	....	....	
20, 230	80, 920	.1433	.0466	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 80, 920
Elastic limit per square inch of original section ....do.... 41, 000
Elongation per inch after rupture...inch.. 0. 2267
Elongation per inch under strain at elastic limit...do.... .001367
Reduction in diameter at point of rupture..do.... .164
Reduction in area after rupture, per centum of original section 49.7
Position of rupture..″.95 from neck
Character of broken surface ....silky
Elongation of inch sections...″.39*, ″.19, ″.10

TABULATION OF TENSION SPECIMENS FROM TUBES FOR 8" CONVERTED RIFLES.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 3 inches.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*				
2813	Breech, No. 7	Inside	47,000	84,800	20.7	52.2	Silky			Third tube.
2814	do	Outside	40,000	83,200	22.8	49.7	do			Do.
2815	do	Middle	42,000	82,000	24.0	49.7	do	7.8557	14.83	Do.
2816	Muzzle, No. 7	Inside	44,000	89,600	17.7	33.5	Granular flaky belt			Do.
2817	do	Outside	43,000	87,200	24.3	47.2	Silky; trace of granulation			Do.
2818	do	Middle	42,000	85,600	20.3	33.5	Granular; dull spot	7.8565	15.91	Do.
2886	do	Inside	41,000	82,200	16.7	21.4	Granular; flaky spot			Third tube.
2887	do	Outside	45,000	84,600	20.0	44.6	Silky, 60 per cent.; granular, 40 per cent			Do.
2888	do	Middle	43,000	85,560	24.0	44.6	Silky			Do.
3010	do	Inside	42,000	82,080	13.0	21.4	Granular; flaky spot			Do.
3011	do	Outside	41,000	81,960	19.8	33.5	do			Do. } Additional specimens.
3012	do	Middle	39,000	81,600	23.8	49.7	Silky			Do.
3083	do	Inside	42,000	82,320	11.7	15.0	Granular			Do.
3084	do	Outside	40,000	82,240	22.8	24.6	Granular; dull spot			Do.
3085	do	Middle	39,000	81,840	24.3	49.7	Silky			Do.
2834	Breech, No. 18	Inside	42,000	81,200	24.0	49.7	do			Third tube.
2835	do	Outside	37,000	77,600	24.0	44.6	do			Do.
2836	do	Middle	42,000	80,800	23.7	47.2	do	7.8583	16.99	Do.
2837	Muzzle, No. 18	Inside	39,000	81,200	21.0	30.6	Granular; dull spot			Do.
2838	do	Outside	43,000	84,000	22.0	44.6	Silky; trace of granulation			Do.
2839	do	Middle	42,000	83,000	21.0	47.2	Silky	7.8492	14.19	Do.
2823	Muzzle, No. 27	Inside	43,000	81,840	20.0	47.2	do			Additional specimen.
2824	do	Outside	42,000	80,400	17.0	30.6	Granular; flaky spot			Do.
2825	do	Middle	43,000	81,360	20.3	36.4	Granular, 70 per cent.; silky, 30 per cent			Do.
2826	Muzzle, No. 44	Inside	43,000	82,000	16.7	21.4	Granular; flaky			New tube.
2827	do	Outside	41,000	81,040	23.0	44.6	Silky			Do.
2828	do	Middle	42,000	80,000	24.0	47.2	do			Do.
2831	do	Inside	45,000	82,040	20.7	41.9	Granular, 60 per cent.; silky, 40 per cent			Do.
2832	do	Outside	43,000	81,520	23.3	30.6	Granular; flaky spot			Do.
2833	do	Middle	42,000	79,600	18.3	27.6	Granular; dull spot	7.8613	14.90	Do. } Additional specimens.
2862	do	Inside	46,000	81,440	21.0	47.2	Silky			Do.
2863	do	Middle	41,000	81,080	20.0	36.4	Silky; trace of granulation			Do.
2864	do	Outside	41,000	79,840	21.7	41.9	Silky; slightly granular			Do.
2865	do	Middle	43,000	80,160	19.7	36.4	Silky; trace of granulation			Do.
2860	Breech, No. 50	Inside	43,000	74,280	22.7	49.7	Silky			New tube.

2881	....do	Outside...	42,000	78,820	24.8	52.2	......do..................	....	....	Do.	
2882	....do	Middle....	42,000	71,680	28.7	57.0	......do..................	7.8566	11.65	Do.	
2883	Muzzle, No. 50....	Inside	45,000	84,490	14.8	24.6	Granular, 80 per cent.; dull flaky, 20 per cent.	....	....	Do.	
2884	....do	Outside...	43,000	84,820	17.7	83.5	Granular; silky spot..........	....	....	Do.	
2885	....do	Middle....	41,000	81,440	21.8	49.7	Silky	7.8550	14.54	Do.	
3013	Breech, No. 50	Inside	42,000	79,840	22.7	52.2	......do..................	....	....	New tube.	Additional specimens.
3014	....do	Outside ..	44,000	82,820	24.0	53.2	......do..................	....	....	Do.	
3015	.. do	Middle....	41,000	78,040	25.7	54.6	......do..................	....	....	Do.	
3016	Muzzle, No. 50....	Inside	43,000	85,160	14.8	24.6	Dull flaky, 60 per cent.; granular, 40 per cent.	....	....	Do.	
3017	....do	Outside...	40,000	79,720	22.8	49.7	Silky	....	....	Do.	
3018	....do	Middle....	42,000	82,840	22.7	41.9	......do..................	....	....	Do.	
3086	....do	Inside	43,000	82,200	20.7	41.9	Silky; trace of granulation	....	....	Do.	
3087	....do	Outside...	43,000	85,760	20.8	44.6	Silky	....	....	Do.	
3088	...do	Middle....	41,000	80,920	22.7	49.7	......do..................	....	....	Do.	

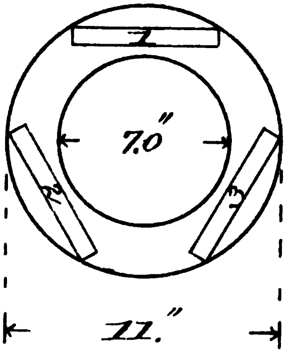
8-INCH STEEL B. L. RIFLE.

STEEL SPECIMENS FROM LINING TUBE, JACKET, HOOPS, BREECH BLOCK, BREECH-BUSHING RING, GAS-CHECK RING, GAS-CHECK CUPS, BLOCK CARRIER, SPINDLE, AND HINGE PIN.

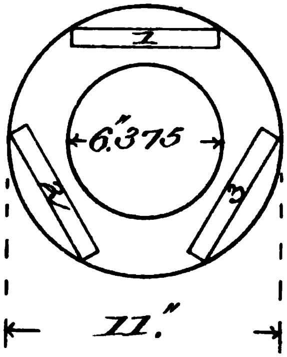
8 inch Steel B. L. Rifle

Lining tube

Breech



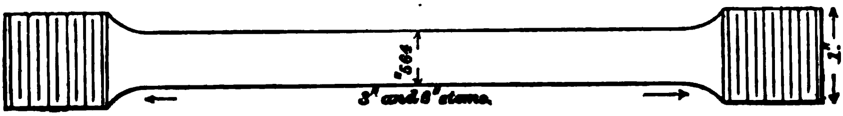
Muzzle

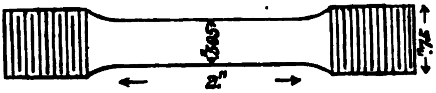


8-INCH STEEL B. L. RIFLE.

DETAILS OF TESTS.

Forms of specimens.





LINING TUBE.

No. 3398.

Marks, $^{8\ R.\ L\ T}_{\ B\ T.\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000700	.000200	0.	....	
6,250	25,000	.000867	.000167	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	0.	....	
10,000	40,000	.001400	.000200	.000033	.000033	
10,250	41,000	.001433	.000033	....	....	
10,500	42,000	.001500	000067	....	....	Elastic limit.
10,750	43,000	.009833	.008333	....	....	
11,000	44,000	.011167	.001334	....	....	
11,250	45,000	.012167	.001000	....	....	
11,500	46,000	.013500	.001333	....	....	
11,750	47,000	.014500	.001000	....	....	
12,000	48,000	.015867	.001367	....	....	
12,250	49,000	.017033	.001166	....	....	
12,500	50,000	.018767	.001734	....	....	
13,000	52,000	.021600	.002833	....	....	
13,500	54,000	.024833	.003233	....	....	
14,000	56,000	.028500	.003667	....	....	
14,500	58,000	.032667	.004167	....	....	
15,000	60,000	.037500	.004833	....	....	
15,500	62,000	.042667	.005167	....	....	
16,000	64,000	.049200	.006533	....	....	
16,500	66,000	.0600	.0108	....	....	
17,000	68,000	.0700	.0100	....	....	
17,500	70,000	.0867	.0167	....	....	
18,000	72,000	.1200	.0333	....	....	
18,080	72,320	.1367	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..pounds..	72,320
Elastic limit per square inch of original section..do....	42,000
Elongation per inch after rupture..inch..	0.3200
Elongation per inch under strain at elastic limit..do....	.001500
Reduction in diameter at point of rupture ....do....	.154
Reduction in area after rupture, per centum of original section..................................	47.2
Position of rupture..	1".15 from neck
Character of broken surface..	silky
Elongation of inch sections....	".36*, ".21, ".09

No. 3399.

Marks, $^{8\,B,\,L\,T}_{B\,T,\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	—.000033	—.000033	
2,500	10,000	.000267	.000167	—.000033	0.	
3,750	15,000	.000433	.000166	—.000033	0.	
5,000	20,000	.000600	.000167	—.000033	0.	
6,250	25,000	.000767	.000167	—.000033	0.	
7,500	30,000	.000933	.000166	—.000033	0.	
8,750	35,000	.001100	.000167	—.000033	0.	
10,000	40,000	.001300	.000200	0.	.000033	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001400	.000067	....	....	
10,750	43,000	.001433	.000033	....	....	Elastic limit.
11,000	44,000	.011667	.010234	....	....	
11,250	45,000	.012500	.000833	....	....	
11,500	46,000	.013267	.000767	....	....	
11,750	47,000	.013933	.000666	....	....	
12,000	48,000	.015433	.001500	....	....	
12,250	49,000	.016600	.001167	....	....	
12,500	50,000	.018333	.001733	....	....	
13,000	52,000	.021167	.002834	....	....	
13,500	54,000	.024600	.003433	....	....	
14,000	56,000	.028167	.003567	....	....	
14,500	58,000	.032333	.004166	....	....	
15,000	60,000	.037500	.005167	....	....	
15,500	62,000	.042867	.005367	....	....	
16,000	64,000	.050000	.007133	....	....	
16,500	66,000	.058333	.008333	....	....	
17,000	68,000	.0700	.011667	....	....	
17,500	70,000	.0867	.0167	....	....	
18,000	72,000	.1100	.0233	....	....	
18,270	73,080	.1600	.0500	....	....	Tensile strength.

General summary.

Specific gravity	7.8578
Hardness	12.36
Tensile strength per square inch of original section .... pounds..	73,080
Elastic limit per square inch of original section .... do....	43,000
Elongation per inch after rupture .... inch..	0.2600
Elongation per inch under strain at elastic limit .... do....	.001433
Reduction in diameter at point of rupture .... do....	.164
Reduction in area after rupture, per centum of original section	49.7
Position of rupture	1″.70 from neck
Character of broken surface	silky
Elongation of inch sections	″.17, ″.45*, ″.16

No. 3400.

Marks, $\substack{8\,R,\ L\,T \\ B\,T,\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.000967	.000134	0.	....	
8, 750	35, 000	.001167	.000200	....	....	
10, 000	40, 000	.001300	.000133	....	....	
10, 250	41, 000	.001367	.000067	....	....	
10, 500	42, 000	.001433	.000066	....	....	
10, 750	43, 000	.001467	.000034	....	....	
11, 000	44, 000	.001500	.000033	....	....	
11, 250	45, 000	.001567	.000067	....	....	Elastic limit.
11, 500	46, 000	.013733	.012166	....	....	
11, 750	47, 000	.014467	.000734	....	....	
12, 000	48, 000	.015600	.001133	....	....	
12, 250	49, 000	.016900	.001300	....	....	
12, 500	50, 000	.018600	.001700	....	....	
13, 000	52, 000	.021233	.002633	....	....	
13, 500	54, 000	.024667	.003434	....	....	
14, 000	56, 000	.028200	.003533	....	....	
14, 500	58, 000	.032233	.004033	....	....	
15, 000	60, 000	.037500	.005267	....	....	
15, 500	62, 000	.042500	.005000	....	....	
16, 000	64, 000	.049333	.006833	....	....	
16, 500	66, 000	.057500	.008167	....	....	
17, 000	68, 000	.0667	.0092	....	....	
17, 500	70, 000	.0800	.0133	....	....	
18, 000	72, 000	.1067	.0267	....	....	
18, 300	73, 200	.1567	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	73, 200
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 2567
Elongation per inch under strain at elastic limit	do....	.001567
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		1″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.15, ″.46*, ″.16

No. 3401.

Marks, $\frac{8\ R_1\ L\ T}{M\ T_1\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000867	.000200	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001233	.000200	0.	....	
9,000	36,000	.001267	.000034	....	....	
9,250	37,000	.001300	.000033	....	....	
9,500	38,000	.001333	.000033	....	....	
9,750	39,000	.001400	.000067	....	....	Elastic limit.
10,000	40,000	.003067	.001667	....	....	
10,250	41,000	.004833	.000766	....	....	
10,500	42,000	.006000	.001167	....	....	
10,750	43,000	.006767	.000767	....	....	
11,000	44,000	.007867	.001100	....	....	
11,250	45,000	.008667	.000800	....	....	
11,500	46,000	.009833	.001166	....	....	
11,750	47,000	.010667	.000834	....	....	
12,000	48,000	.011933	.001266	....	....	
12,250	49,000	.013033	.001100	....	....	
12,500	50,000	.014667	.001634	....	....	
13,000	52,000	.017000	.002333	....	....	
13,500	54,000	.019667	.002667	....	....	
14,000	56,000	.022500	.002833	....	....	
14,500	58,000	.025833	.003333	....	....	
15,000	60,000	.029533	.003700	....	....	
15,500	62,000	.034000	.004467	....	....	
16,000	64,000	.038333	.004333	....	....	
16,500	66,000	.044000	.005667	....	....	
17,000	68,000	.050333	.006333	....	....	
17,500	70,000	.058500	.008167	....	....	
18,000	72,000	.0700	.0115	....	....	
18,500	74,000	.0867	.0167	....	....	
19,000	76,000	.1067	.0200	....	....	
19,140	76,560	.1400	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	76,560
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.1867
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.85 from neck
Character of broken surface		silky; serrated, 50 per cent.; granular, 50 per cent.
Elongation of inch sections		″.28* ″.17, ″.11

No. 3402.

Marks, $\overset{S\,R_1\,L\,T}{M\,T_2\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
9,000	36,000	.001200	.000067	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	....	....	
10,250	41,000	.001367	.000034	....	....	Elastic limit.
10,500	42,000	.006667	.005300	....	....	
10,750	43,000	.007333	.000666	....	....	
11,000	44,000	.007700	.000367	....	....	
11,250	45,000	.008167	.000467	....	....	
11,500	46,000	.009267	.001100	....	....	
11,750	47,000	.010167	.000900	....	....	
12,000	48,000	.011600	.001433	....	....	
12,250	49,000	.012667	.001067	....	....	
12,500	50,000	.013667	.001000	....	....	
13,000	52,000	.016100	.002433	....	....	
13,500	54,000	.019000	.002900	....	....	
14,000	56,000	.021833	.002833	....	....	
14,500	58,000	.024733	.002900	....	....	
15,000	60,000	.028333	,003600	....	....	
15,500	62,000	.032500	.004167	....	....	
16,000	64,000	.037333	.004833	....	....	
16,500	66,000	.042333	.005000	....	....	
17,000	68,000	.048833	.006500	....	....	
17,500	70,000	.056000	,007167	....	....	
18,000	72,000	.0667	.0107	....	....	
18,500	74,000	.0767	.0100	....	....	
19,000	76,000	.1000	.0233	....	....	
19,340	77,360	.1600	.0600	....	....	Tensile strength.

General summary.

Specific gravity		7.8548
Hardness		12.72
Tensile strength per square inch of original section	pounds	77,360
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.2067
Elongation per inch under strain at elastic limit	do	.001367
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		″1.25 from neck
Character of broken surface		silky; serrated
Elongation of inch sections		″.14, ″.28*, ″.20

No. 3403.

Marks, $\substack{\text{S B, L T} \\ \text{M T, M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001300	.000067	....	....	
9,750	39,000	.001333	.000033	....	....	
10,000	40,000	.001367	.000034	....	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	Elastic limit.
11,000	44,000	.002233	.000766	....	....	
11,250	45,000	.002567	.000334	....	....	
11,500	46,000	.003233	.000666	....	....	
11,750	47,000	.004667	.001434	....	....	
12,000	48,000	.006000	.001333	....	....	
12,250	49,000	.006833	.000833	....	....	
12,500	50,000	.007833	.001000	....	....	
13,000	52,000	.009867	.002034	....	....	
13,500	54,000	.012167	.002300	....	....	
14,000	56,000	.014433	.002266	....	....	
14,500	58,000	.016833	.002400	....	....	
15,000	60,000	.019333	.002500	....	....	
15,500	62,000	.022333	.003000	....	....	
16,000	64,000	.025167	.002834	....	....	
16,500	66,000	.028667	.003500	....	....	
17,000	68,000	.032100	.003433	....	....	
17,500	70,000	.036667	.004567	....	....	
18,000	72,000	.041500	.004833	....	....	
18,500	74,000	.047233	.005733	....	....	
19,000	76,000	.054500	.007267	....	....	
19,500	78,000	.0632	.0087	....	....	
20,000	80,000	.0767	.0135	....	....	
20,480	81,920	.1200	.0433	....	....	Tensile strength.

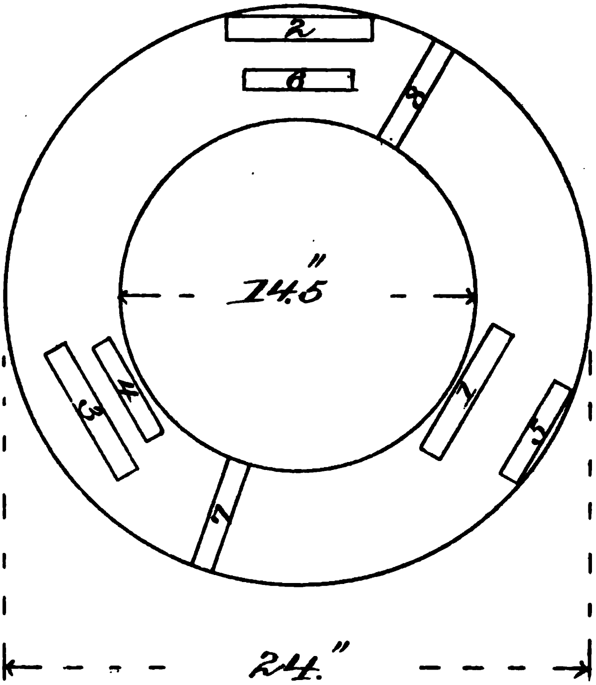
General summary.

Tensile strength per square inch of original section	pounds	81,920
Elastic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.1583
Elongation per inch under strain at elastic limit	do	.001467
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.45 from neck, oblique
Character of broken surface		silky serrated
Elongation of inch sections		″.07, ″.08, ″.31*

8 inch Steel B. L. Rifle

Jacket

Breech



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JACKET.

No. 3134.

Marks, $\genfrac{}{}{0pt}{}{8\ R,\ J}{B\ T,\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001400	.000200	.000067	.000067	
10,250	41,000	.001433	.000033	....	....	
10,500	42,000	.001500	.000067	....	....	
10,750	43,000	.001567	.000067	....	....	
11,000	44,000	.001600	.000033	....	....	
11,250	45,000	.001633	.000033	....	....	
11,500	46,000	.001667	.000084	....	....	**Elastic limit.**
11,750	47,000	.001767	.000100	....	....	
12,000	48,000	.001900	.000133	....	....	
12,250	49,000	.002067	.000167	....	....	
12,500	50,000	.002367	.000300	....	....	
12,750	51,000	.002633	.000266	....	....	
13.000	52,000	.002900	.000267	....	....	
13,250	53,000	.003300	.000400	....	....	
13,500	54,000	.003900	.000600	....	....	
13,750	55,000	.004333	.000433	....	....	
14,000	56,000	.005000	.000667	....	....	
14,250	57,000	.005700	.000700	....	....	
14,500	58,000	.006500	.000800	....	....	
14,750	59,000	.007200	.000700	....	....	
15,000	60,000	.008000	.000800	....	....	
15.500	62,000	.009833	.001833	....	....	
16.000	64,000	.011500	.001667	....	....	
16,500	66,000	.013400	.001900	....	....	
17,000	68,000	.015267	.001867	....	....	
17,500	70,000	.017367	.002100	....	....	
18,000	72,000	.019333	.001966	....	....	
18,500	74,000	.021667	.002334	....	....	
19,000	76.000	.023900	.002233	....	....	
19.500	78,000	.026867	.002967	....	....	
20,000	80,000	.029367	.002500	....	....	
20,500	82,000	.032667	.003300	....	....	
21,000	84,000	.036533	.003866	....	....	
21,500	86,000	.0383	.001767	....	....	
22,000	88,000	.0417	.0034	....	....	
22,500	90,000	.0500	.0083	....	....	
23,000	92,000	.0567	.0067	....	....	
23,500	94,000	.0667	.0100	....	....	
24,000	96,000	.0767	.0100	....	....	
24,500	98,000	.1100	.0333	....	....	
24,600	98,400	.1400	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	98,400
Elastic limit per square inch of original section	do....	46,000
Elongation per inch after rupture	inch..	0.1733
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		86.4
Position of rupture		″.75 from neck
Character of broken surface		silky; slight granulation
Elongation of inch sections		″.29*, ″.13, ″.10

No. 3135.

Marks, $\frac{\text{S R}_1\text{ J}}{\text{B T}_2\text{ O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001400	.000233	.000067	.000067	
11, 250	45, 000	.001633	.000233	....	....	
12, 500	50, 000	.001800	.000167	....	....	
12, 750	51, 000	.001867	.000067	....	....	
13, 000	52, 000	.001933	.000066	....	....	
13, 250	53, 000	.001967	.000034	....	....	
13, 500	54, 000	.002000	.000033	....	....	
13, 750	55, 000	.002067	.000067	....	....	Elastic limit.
14, 000	56, 000	.002200	.000133	....	....	
14, 250	57, 000	.002367	.000167	....	....	
14, 500	58, 000	.002567	.000200	....	....	
14, 750	59, 000	.002800	.000233	....	....	
15, 000	60, 000	.003100	.000300	....	....	
15, 500	62, 000	.003867	.000767	....	....	
16, 000	64, 000	.004900	.001033	....	....	
16, 500	66, 000	.006000	.001100	....	....	
17, 000	68, 000	.007400	.001400	....	....	
17, 500	70, 000	.009067	.001667	....	....	
18, 000	72, 000	.010400	.001333	....	....	
18, 500	74, 000	.011933	.001533	....	....	
19, 000	76, 000	.013400	.001467	....	....	
19, 500	78, 000	.015167	.001767	....	....	
20, 000	80, 000	.016867	.001700	....	....	
20, 500	82, 000	.018633	.001766	....	....	
21, 000	84, 000	.020533	.001900	....	....	
21, 500	86, 000	.022500	.001967	....	....	
22, 000	88, 000	.024867	.002367	....	....	
22, 500	90, 000	.026933	.002066	....	....	
23, 000	92, 000	.029833	.002900	....	....	
23, 500	94, 000	.032600	.002767	....	....	
24, 000	96, 000	.035333	.002733	....	....	
24, 500	98, 000	.0383	.002967	....	....	
25, 000	100, 000	.0417	.0034	....	....	
25, 500	102, 000	.0450	.0033	....	....	
26, 000	104, 000	.0567	.0117	....	....	
26, 500	106, 000	.0633	.0066	....	....	
27, 000	108, 000	.0700	.0067	....	....	
27, 500	110, 000	.0933	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	110, 000
Elastic limit per square inch of original section ....do....	55, 000
Elongation per inch after rupture ....inch..	0. 1033
Elongation per inch under strain at elastic limit ....do....	.002067
Reduction in diameter at point of rupture ....do....	.064
Reduction in area after rupture, per centum of original section	21. 4
Position of rupture	″.65 from neck
Character of broken surface. ....granular; dull spot radiating from circumference; cracks in surface of stem.	
Elongation of inch sections	″.16*, ″.09, ″.06

No. 3136.

Marks, $\substack{8\ R_1\ J \\ B\ T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	.000067	.000067	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001433	.000066	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001533	.000033	....	....	
11,500	46,000	.001600	.000067	....	....	
11,750	47,000	.001667	.000067	....	....	Elastic limit.
12,000	48,000	.001833	.000166	....	....	
12,250	49,000	.002133	.000300	....	....	
12,500	50,000	.002433	.000300	....	....	
12,750	51,000	.002800	.000367	....	....	
13,000	52,000	.003167	.000367	....	....	
13,250	53,000	.003633	.000466	....	....	
13,500	54,000	.004100	.000467	....	....	
13,750	55,000	.004667	.000567	....	....	
14,000	56,000	.005267	.000600	....	....	
14,250	57,000	.006000	.000733	....	....	
14,500	58,000	.006667	.000667	....	....	
14,750	59,000	.007300	.000633	....	....	
15,000	60,000	.007967	.000667	....	....	
15,500	62,000	.009700	.001733	....	....	
16,000	64,000	.011267	.001567	....	....	
16,500	66,000	.012767	.001500	....	....	
17,000	68,000	.014600	.001833	....	....	
17,500	70,000	.016333	.001783	....	....	
18,000	72,000	.018400	.002067	....	....	
18,500	74,000	.020333	.001933	....	....	
19,000	76,000	.022167	.001834	....	....	
19,500	78,000	.024867	.002700	....	....	
20,000	80,000	.027233	.002366	....	....	
20,500	82,000	.029933	.002700	....	....	
21,000	84,000	.033000	.003067	....	....	
21,500	86,000	.036233	.003233	....	....	
22,000	88,000	.0400	.003767	....	....	
22,500	90,000	.0433	.0033	....	....	
23,000	92,000	.0467	.0034	....	....	
23,500	94,000	.0533	.0066	....	....	
24,000	96,000	.0633	.0100	....	....	
24,500	98,000	.0733	.0100	....	....	
25,000	100,000	.0900	.0167	....	....	
25,200	100,800	.1267	.0367	....	....	Tensile strength.

General summary.

Specific gravity 7.8528
Hardness 20.36
Tensile strength per square inch of original section ....pounds.. 100,800
Elastic limit per square inch of original section ....do.... 47,000
Elongation per inch after rupture ....inch.. 0.1267
Elongation per inch under strain at elastic limit ....do.... .001667
Reduction in diameter at point of rupture ....do.... .064
Reduction in area after rupture, per centum of original section 21.4
Position of rupture ....1″ from neck
Character of broken surface......granular; dull streak ″.1 wide extending across fractured surface; cracks in surface of stem.
Elongation of inch sections ....″.16*, ″.13, ″.09

No. 727.

Marks, $\frac{8\,R_1\,J}{B\,T_4\,I}$

Length, 4″.5.

Diameter, ″.798.

Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000900	.000133	0.	....	
17,500	35,000	.001067	.000167	—.000067	—.000067	
20,000	40,000	.001200	.000133	—.000100	—.000033	
20,500	41,000	.001233	.000033	....	....	
21,000	42,000	.001267	.000034	....	....	
21,500	43,000	.001300	.000033	....	....	
22,000	44,000	.001333	.000033	....	....	
22,500	45,000	.001367	.000034	....	....	
23,000	46,000	.091433	.000066	....	....	
23,500	47,000	.001467	.000034	....	....	
24,000	48,000	.001500	.000033	....	....	
24,500	49,000	.001567	.000067	....	....	Elastic limit.
25,000	50,000	.001667	.000100	....	....	
25,500	51,000	.001900	.000233	....	....	
26,000	52,000	.002433	.000533	....	....	
26,500	53,000	.003067	.000634	....	....	
27,000	54,000	.003500	.000433	....	....	
27,500	55,000	.003667	.000167	....	....	
28,000	56,000	.004033	.000366	....	....	
28,500	57,000	.004733	.000700	....	....	
29,000	58,000	.005467	.000734	....	....	
29,500	59,000	.006000	.000533	....	....	
30,000	60,000	.006667	.000667	....	....	
49,100	98,200	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 728.

Marks, $\substack{8\ R,\ J \\ B\ T,\ O}$
Length, 4''.5.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000133	.000133	0.	....	
5, 000	10, 000	.000267	.000134	0.	....	
7, 500	15, 000	.000400	.000133	0.	....	
10, 000	20, 000	.000533	.000133	0.	....	
12, 500	25. 000	.000700	.000167	0.	....	
15, 000	30, 000	.000900	.000200	0.	....	
17, 500	35, 000	.001067	.000167	.000033	.000033	
20, 000	40, 000	.001233	.000166	.000067	.000034	
20, 500	41, 000	.001300	.000067	....	....	
21, 000	42, 000	.001333	.000033	....	....	
21, 500	43, 000	.001433	.000100	....	....	
22, 000	44, 000	.001500	.000067	....	....	
22, 500	45. 000	.001533	.000033	....	....	
23, 000	46, 000	.001567	.000034	....	....	
23, 500	47, 000	.001633	.000066	....	....	
24, 000	48, 000	.001667	.000034	....	....	
24. 500	49, 000	.001700	.000033	....	....	
25, 000	50, 000	.001767	.000067	....	....	
25, 500	51, 000	.001833	.000066	....	....	
26, 000	52, 000	.001900	.000067	....	....	Elastic limit.
26, 500	53, 000	.002000	.000100	....	....	
27, 000	54, 000	.002167	.000167	....	....	
27, 500	55, 000	.002300	.000133	....	....	
28, 000	56, 000	.002433	.000133	....	....	
28, 500	57, 000	.002667	.000234	....	....	
29, 000	58, 000	.002967	.000300	....	....	
29, 500	59, 000	.003300	.000333	....	....	
30, 000	60, 000	.003600	.000300	....	....	
30, 500	61, 000	.004000	.000400	....	....	
31, 000	62, 000	.004400	.000400	....	....	
31, 500	63, 000	.004900	.000500	....	....	
32, 000	64. 000	.005400	.000500	....	....	
32, 500	65, 000	.005967	.000567	....	....	
33, 000	66, 000	.006500	.000533	....	....	
33, 500	67, 000	.007100	.000600	....	....	
53, 800	107, 600	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 729.

Marks, $\overset{8\ R_1\ J}{B\ T_6\ M}$
Length, 4''.5.
Diameter, ''.799.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000233	.000166	0.	....	
7,500	15,000	.000400	.000167	0.	....	
10,000	20,000	.000567	.000167	0.	....	
12,500	25,000	.000767	.000200	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40,000	.001267	.000167	0.	....	
20,500	41,000	.001300	.000033	....	....	
21,000	42,000	.001333	.000033	....	....	
21,500	43,000	.001367	.000034	....	....	
22,000	44,000	.001400	.000033	....	....	
22,500	45,000	.001433	.000033	....	....	
23,000	46,000	.001500	.000067	....	....	
23,500	47,000	.001533	.000033	....	....	
24,000	48,000	.001567	.000034	....	....	
24,500	49,000	.001600	.000033	....	....	Elastic limit.
25,000	50,000	.001733	.000133	....	....	
25,500	51,000	.001867	.000134	....	....	
26,000	52,000	.002100	.000233	....	....	
26,500	53,000	.002367	.000267	....	....	
27,000	54,000	.002600	.000233	....	....	
27,500	55,000	.002900	.000300	....	....	
28,000	56,000	.003233	.000333	....	....	
28,500	57,000	.003567	.000334	....	....	
29,000	58,000	.004000	.000433	....	....	
29,500	59,000	.004433	.000433	....	....	
30,000	60,000	.004933	.000500	....	....	
30,500	61,000	.005467	.000534	....	....	
31,000	62,000	.006000	.000533	....	....	
31,500	63,000	.006567	.000567	....	....	
32,000	64,000	.007100	.000533	....	....	
49,100	98,200	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 730.

Marks, ${}^{8\,\mathrm{R.\,J}}_{\mathrm{B\,R.}}$
Length, 4″.27.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001067	.000134	0.	....	
20,000	40,000	.001233	.000166	0.	....	
20,500	41,000	.001267	.000034	....	....	
21,000	42,000	.001300	.000033	....	....	
21,500	43,000	.001333	.000033	....	....	
22,000	44,000	.001367	.000034	....	....	Elastic limit
22,500	45,000	.001467	.000100	....	....	
23,000	46,000	.001567	.000100	....	....	
23,500	47,000	.001700	.000133	....	....	
24,000	48,000	.001967	.000267	....	....	
24,500	49,000	.002300	.000333	....	....	
25,000	50,000	.002500	.000200	....	....	
25,500	51,000	.002833	.000333	....	....	
26,000	52,000	.003167	.000334	....	....	
26,500	53,000	.003500	.000333	....	....	
27,000	54,000	.003933	.000433	....	....	
27,500	55,000	.004333	.000400	....	....	
28,000	56,000	.004833	.000500	....	....	
28,500	57,000	.005333	.000500	....	....	
29,000	58,000	.005933	.000600	....	....	
29,500	59,000	.006500	.000167	....	....	
30,000	60,000	.007000	.000500	....	....	
53,600	107,200	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 731.

Marks, $^{\mathrm{S\,R,\,J}}_{\mathrm{B\,R.}}$
Length, 4''.20.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000783	.000183	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001067	.000167	0.	....	
20,000	40,000	.001233	.000166	.000033	.000033	
20,500	41,000	.001267	.000034	....	....	
21,000	42,000	.001333	.000066	....	....	
21,500	43,000	.001333	0.	....	....	
22,000	44,000	.001367	.000034	....	....	
22,500	45,000	.001433	.000066	....	....	
23,000	46,000	.001467	.000034	....	....	Elastic limit.
23,500	47,000	.001567	.000100	....	....	
24,000	48,000	.001733	.000166	....	....	
24,500	49,000	.001967	.000234	....	....	
25,000	50,000	.002300	.000333	....	....	
25,500	51,000	.002567	.000267	....	....	
26,000	52,000	.002933	.000366	....	....	
26,500	53,000	.003233	.000300	....	....	
27,000	54,000	.003667	.000434	....	....	
27,500	55,000	.004067	.000400	....	....	
28,000	56,000	.004533	.000466	....	....	
28,500	57,000	.005000	.000467	....	....	
29,000	58,000	.005567	.000567	....	....	
29,500	59,000	.006167	.000600	....	....	
30,000	60,000	.006667	.000500	....	....	
52,900	105,800	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 3155.

Marks, $^{S\ R,\ J}_{B\ T,\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	Elastic limit.
11,500	46,000	.001633	.000133	....	....	
11,750	47,000	.001767	.000134	....	....	
12,000	48,000	.002267	.000500	....	....	
12,250	49,000	.003100	.000833	....	....	
12,500	50,000	.003833	.000733	....	....	
12,750	51,000	.004500	.000667	....	....	
13,000	52,000	.005067	.000567	....	....	
13,250	53,000	.005533	.000466	....	....	
13,500	54,000	.006333	.000800	....	....	
13,750	55,000	.006933	.000600	....	....	
14,000	56,000	.007900	.000967	....	....	
14,250	57,000	.008700	.000800	....	....	
14,500	58,000	.009467	.000767	....	....	
14,750	59,000	.010333	.000866	....	....	
15,000	60,000	.011500	.001167	....	....	
15,500	62,000	.013033	.001533	....	....	
16,000	64,000	.014833	.001800	....	....	
16,500	66,000	.016900	.002067	....	....	
17,000	68,000	.018733	.001833	....	....	
17,500	70,000	.020900	.002167	....	....	
18,000	72,000	.023333	.002433	....	....	
18,500	74,000	.026000	.002667	....	....	
19,000	76,000	.028333	.002333	....	....	
19,500	78,000	.031033	.002700	....	....	
20,000	80,000	.034500	.003467	....	....	
20,500	82,000	.038000	.003500	....	....	
21,000	84,000	.042167	.004167	....	....	
21,500	86,000	.046333	.004166	....	....	
22,000	88,000	.0533	.006967	....	....	
22,500	90,000	.0600	.0067	....	....	
23,000	92,000	.0667	.0067	....	....	
23,500	94,000	.0800	.0133	....	....	
23,940	95,760	.1200	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	95,760
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.1267
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		1″.05 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.10, ″.14, ″.14*

No. 3156.

Marks, $\substack{8\ R_1\ J \\ B\ T_{10}\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000800	.000200	0.	....	
7, 500	30, 000	.001000	.000200	0.	....	
8, 750	35, 900	.001167	.000167	0.	....	
10, 000	40, 000	.001367	.000200	.000033	.000033	
10, 250	41, 000	.001400	.000033	....	....	
10, 500	42, 000	.001433	.000033	....	....	
10, 750	43, 000	.001500	.000067	....	....	
11, 000	44, 000	.001533	.000033	....	....	
11, 250	45, 000	.001600	.000167	....	....	Elastic limit.
11, 500	46, 000	.001733	.000133	....	....	
11, 750	47, 000	.001933	.000200	....	....	
12, 000	48, 000	.002467	.000534	....	....	
12, 250	49, 000	.002967	.000500	....	....	
12, 500	50, 000	.003500	.000533	....	....	
13, 000	52, 000	.004767	.001267	....	....	
13, 500	54, 000	.006333	.001566	....	....	
14, 000	56, 000	.008167	.001834	....	....	
14, 500	58, 000	.009833	.001666	....	....	
15, 000	60, 000	.011600	.001767	....	....	
15, 500	62, 000	.013367	.001767	....	....	
16, 000	64, 000	.015367	.002000	....	....	
16, 500	66, 000	.017500	.002133	....	....	
17, 000	68, 000	.019667	.002167	....	....	
17, 500	70, 000	.021800	.002133	....	....	
18, 000	72, 000	.024333	.002533	....	....	
18, 500	74, 000	.027067	.002734	....	....	
19, 000	76, 000	.029833	.002766	....	....	
19, 500	78, 000	.033333	.003500	....	....	
20, 000	80, 000	.036667	.003334	....	....	
20, 500	82, 000	.040833	.004166	....	....	
21, 000	84, 000	.045500	.004667	....	....	
21, 500	86, 000	.050667	.005167	....	....	
22, 000	88, 000	.0567	.006067	....	....	
22, 500	90, 000	.0667	.0100	....	....	
23, 000	92, 000	.0800	.0133	....	....	
23, 500	94, 000	.1133	.0333	....	....	
23, 560	94, 240	.1300	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	94, 240
Elastic limit per square inch of original section	do...	45, 000
Elongation per inch after rupture	inch..	0. 2003
Elongation per inch under strain at elastic limit	do...	.001600
Reduction in diameter at point of rupture	do...	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		1".25 from neck
Character of broken surface		silky
Elongation of inch sections		".17, ".31*, ".13

No. 3157.

Marks, $^{8\,B_1\,J}_{B\,T_{11}\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.001000	.000200	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001500	.000067	....	....	
11,250	45,000	.001533	.000033	....	....	Elastic limit.
11,500	46,000	.001633	.000100	....	....	
11,750	47,000	.001967	.000334	....	....	
12,000	48,000	.003067	.001100	....	....	
12,250	49,000	.003500	.000433	....	....	
12,500	50,000	.004400	.000900	....	....	
13,000	52,000	.005667	.001267	....	....	
13,500	54,000	.007167	.001500	....	....	
14,000	56,000	.008667	.001500	....	....	
14,500	58,000	.010233	.001566	....	....	
15,000	60,000	.011933	.001700	....	....	
15,500	62,000	.013733	.001800	....	....	
16,000	64,000	.015567	.001834	....	....	
16,500	66,000	.017567	.002000	....	....	
17,000	68,000	.019567	.002000	....	....	
17,500	70,000	.022167	.002600	....	....	
18,000	72,000	.024333	.002166	....	....	
18,500	74,000	.027000	.002667	....	....	
19,000	76,000	.029667	.002667	....	....	
19,500	78,000	.032167	.002500	....	....	
20,000	80,000	.035667	.003500	....	....	
20,500	82,000	.039333	.003666	....	....	
21,000	84,000	.043567	.004234	....	....	
21,500	86,000	.048500	.004933	....	....	
22,000	88,000	.0567	.0082	....	....	
22,500	90,000	.0633	.0066	....	....	
23,000	92,000	.0733	.0100	....	....	
23,500	94,000	.0933	.0200	....	....	
23,700	94,800	.1233	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	94,800
Elastict limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.1300
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		1".25 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		".13,".16*,".10

No. 3158.

Marks, $\frac{S\ R_1\ J}{B\ T_1,\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000533	.000233	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000867	.000167	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	0.	....	
10,000	40,000	.001367	.000167	0.	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001533	.000033	....	....	
11,500	46,000	.001600	.000067	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001667	.000034	....	....	
12,250	49,000	.001700	.000033	....	....	
12,500	50,000	.001767	.000067	....	....	
12,750	51,000	.001833	.000066	....	....	
13,000	52,000	.001867	.000034	....	....	
13,250	53,000	.001900	.000033	....	....	
13,500	54,000	.001967	.000067	....	....	
13,750	55,000	.002033	.000066	....	....	Elastic limit.
14,000	56,000	.002200	.000167	....	....	
14,250	57,000	.002367	.000167	....	....	
14,500	58,000	.002533	.000166	....	....	
14,750	59,000	.003033	.000500	....	....	
15,000	60,000	.003833	.000800	....	....	
15,500	62,000	.005067	.001234	....	....	
16,000	64,000	.006400	.001333	....	....	
16,500	66,000	.007867	.001467	....	....	
17,000	68,000	.009333	.001466	....	....	
17,500	70,000	.010867	.001534	....	....	
18,000	72,000	.012500	.001633	....	....	
18,500	74,000	.014067	.001567	....	....	
19,000	76,000	.015600	.001533	....	....	
19,500	78,000	.017367	.001767	....	....	
20,000	80,000	.019100	.001733	....	....	
20,500	82,000	.021167	.002067	....	....	
21,000	84,000	.023000	.001833	....	....	
21,500	86,000	.025167	.002167	....	....	
22,000	88,000	.027500	.002333	....	....	
22,500	90,000	.029867	.002367	....	....	
23,000	92,000	.032667	.002800	....	....	
23,500	94,000	.035667	.003000	....	....	
24,000	96,000	.039000	.003333	....	....	
24,500	98,000	.042667	.003667	....	....	
25,000	100,000	.0467	.004033	....	....	
25,500	102,000	.0533	.0066	....	....	
26,000	104,000	.0633	.0100	....	....	
26,500	106,000	.0700	.0067	....	....	
27,000	108,000	.0900	.0200	....	....	
27,100	108,400	.1000	.0100	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,400
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1033
Elongation per inch under strain at elastic limit	do....	.002033
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		″.75 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.08, ″.09, ″.14″

No. 3354.

Marks, $\overset{8\,E_1\,J}{B\,T_{18}\,I}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000033	—.000033	
2,500	10,000	.000200	.000133	—.000033	0.	
3,750	15,000	.000333	.000133	—.000033	0.	
5,000	20,000	.000500	.000167	—.000067	—.000034	
6,250	25,000	.000633	.000133	—.000067	....	
7,500	30,000	.000800	.000167	—.000067	....	
8,750	35,000	.001000	.000200	....	....	
10,000	40,000	.001167	.000167	....	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001267	.000067	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001367	.000067	....	....	
11,250	45,000	.001400	.000033	....	....	Elastic limit.
11,500	46,000	.001567	.000167	....	....	
11,750	47,000	.001867	.000300	....	....	
12,000	48,000	.003000	.001133	....	....	
12,250	49,000	.003700	.000700	....	....	
12,500	50,000	.004600	.000900	....	....	
12,750	51,000	.005567	.000967	....	....	
13,000	52,000	.006400	.000833	....	....	
13,250	53,000	.007367	.000967	....	....	
13,500	54,000	.008267	.000900	....	....	
13,750	55,000	.009033	.000766	....	....	
14,000	56,000	.009933	.000900	....	....	
14,250	57,000	.010900	.000967	....	....	
14,500	58,000	.011900	.001000	....	....	
14,750	59,000	.012833	.000933	....	....	
15,000	60,000	.013767	.000934	....	....	
15,500	62,000	.015900	.002133	....	....	
16,000	64,000	.017867	.001967	....	....	
16,500	66,000	.020167	.002300	....	....	
17,000	68,000	.022667	.002500	....	....	
17,500	70,000	.025500	.002833	....	....	
18,000	72,000	.028000	.002500	....	....	
18,500	74,000	.031033	.003033	....	....	
19,000	76,000	.034667	.003634	....	....	
19,500	78,000	.038200	.003533	....	....	
20,000	80,000	.041670	.003470	....	....	
20,500	82,000	.0450	.003330	....	....	
21,000	84,000	.0533	.0083	....	....	
21,500	86,000	.0600	.0067	....	....	
22,000	88,000	.0733	.0133	....	....	
22,500	90,000	.0900	.0167	....	....	
22,810	91,240	.1300	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	91,240
Elastic limit per square inch of original section	do	45,000
Elongation per inch after rupture	inch	0.2233
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1″.25 from neck
Character of broken surface		silky
Elongation of inch sections		″.21, ″.29*, ″.17

No. 3355.

Marks, $\begin{smallmatrix}8\ R_1\ J\\ B\ T_{14}\ O\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001367	.000167	....	....	
10,250	41,000	.001433	.000066	....	....	
10,500	42,000	.001467	.000034	....	....	
10,750	43,000	.001500	.000033	....	....	
11,000	44,000	.001533	.000033	....	....	
11,250	45,000	.001567	.000034	....	....	
11,500	46,000	.001600	.000033	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001700	.000067	....	....	
12,250	49,000	.001733	.000033	....	....	
12,500	50,000	.001800	.000067	....	....	Elastic limit.
12,750	51,000	.001900	.000100	....	....	
13,000	52,000	.001967	.000067	....	....	
13,250	53,000	.002167	.000200	....	....	
13,500	54,000	.002633	.000466	....	....	
13,750	55,000	.003467	.000834	....	....	
14,000	56,000	.004267	.000800	....	....	
14,250	57,000	.004933	.000666	....	....	
14,500	58,000	.005733	.000800	....	....	
14,750	59,000	.006500	.000767	....	....	
15,000	60,000	.007400	.000900	....	....	
15,500	62,000	.008933	.001533	....	....	
16,000	64,000	.010600	.001667	....	....	
16,500	66,000	.012267	.001667	....	....	
17,000	68,000	.014067	.001800	....	....	
17,500	70,000	.015833	.001766	....	....	
18,000	72,000	.017567	.001734	....	....	
18,500	74,000	.019433	.001866	....	....	
19,000	76,000	.021367	.001934	....	....	
19,500	78,000	.023533	.002166	....	....	
20,000	80,000	.025500	.001967	....	....	
20,500	82,000	.028200	.002700	....	....	
21,000	84,000	.031000	.002800	....	....	
21,500	86,000	.034033	.003033	....	....	
22,000	88,000	.037500	.003467	....	....	
22,500	90,000	.041167	.003667	....	....	
23,000	92,000	.045500	.004333	....	....	
23,500	94,000	.0533	.0078	....	....	
24,000	96,000	.0600	.0067	....	....	
24,500	98,000	.0667	.0067	....	....	
25,000	100,000	.0800	.0133	....	....	
25,250	101,000	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	101,000
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1000
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		1″ from neck
Character of broken surface		granular, radiating from a silky spot at circumference
Elongation of inch sections		″.12*, ″.11, ″.07

No. 3356.

Marks, $\begin{smallmatrix}8\ R_1\ J\\ B\ T_4\ M\end{smallmatrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads. Total.	Applied loads. Per square inch.	Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000167	.000167	0.	....	
2,000	10,000	.000333	.000166	0.	....	
3,000	15,000	.000500	.000167	0.	....	
4,000	20,000	.000667	.000167	0.	....	
5,000	25,000	.000833	.000166	0.	....	
6,000	30,000	.001000	.000167	0.	....	
7,000	35,000	.001167	.000167	0.	....	
8,000	40,000	.001367	.000200	.000033	.000033	
8,200	41,000	.001400	.000033	....	....	
8,400	42,000	.001467	.000067	....	....	
8,600	43,000	.001533	.000066	....	....	Elastic limit.
8,800	44,000	.001633	.000100	....	....	
9,000	45,000	.001867	.000234	....	....	
9,200	46,000	.003833	.001966	....	....	
9,400	47,000	.005267	.001434	....	....	
9,600	48,000	.005667	.000400	....	....	
9,800	49,000	.006600	.000934	....	....	
10,000	50,000	.007000	.000400	....	....	
10,200	51,000	.007667	.000667	....	....	
10,400	52,000	.008733	.001066	....	....	
10,600	53,000	.009667	.000934	....	....	
10,800	54,000	.010500	.000833	....	....	
11,000	55,000	.011567	.001067	....	....	
11,200	56,000	.012567	.001000	....	....	
11,400	57,000	.013667	.001100	....	....	
11,600	58,000	.014667	.001000	....	....	
11,800	59,000	.015667	.001000	....	....	
12,000	60,000	.016767	.001100	....	....	
12,400	62,000	.018333	.001566	....	....	
12,800	64,000	.020900	.002567	....	....	
13,200	66,000	.023567	.002667	....	....	
13,600	68,000	.026000	.002433	....	....	
14,000	70,000	.028833	.002833	....	....	
14,400	72,000	.032500	.003667	....	....	
14,800	74,000	.036000	.003500	....	....	
15,200	76,000	.040167	.004167	....	....	
15,600	78,000	.044667	.004500	....	....	
16,000	80,000	.0500	.005333	....	....	
16,400	82,000	.0567	.0067	....	....	
16,800	84,000	.0633	.0066	....	....	
17,200	86,000	.0733	.0100	....	....	
17,600	88,000	.0933	.0200	....	....	
17,820	89,100	.1333	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 89, 1
Elastic limit per square inch of original section....................................do.... 43, 0
Elongation per inch after rupture....................................inch.. 0. 20
Elongation per inch under strain at elastic limit....................................do.... .0015
Reduction in diameter at point of rupture....................................do.... . 1
Reduction in area after rupture, per centum of original section .... 40.
Position of rupture....................................1″.15 from nec
Character of broken surface....................................silk
Elongation of inch sections....................................″.13, ″.20, ″.2

No. 739.

Marks, $^{8\ R_1\ J}_{B\ T_{16}\ M}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

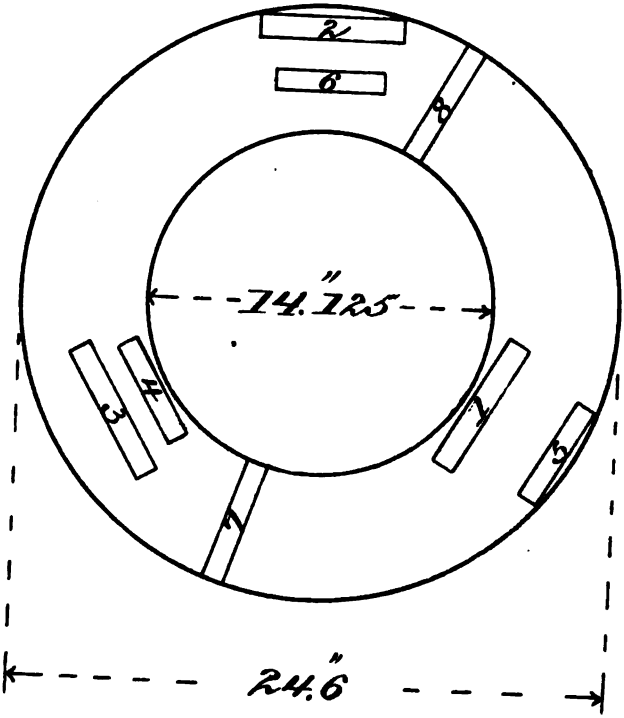
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40,000	.001267	.000167	....	....	
20,500	41,000	.001300	.000033	....	....	
21,000	42,000	.001333	.000033	....	....	
21,500	43,000	.001367	.000034	....	....	
22,000	44,000	.001400	.000033	....	....	
22,500	45,000	.001433	.000033	....	....	
23,000	46,000	.001467	.000034	....	....	
23,500	47,000	.001533	.000066	....	....	Elastic limit.
24,000	48,000	.001700	.000167	....	....	
24,500	49,000	.002133	.000433	....	....	
25,000	50,000	.002933	.000800	....	....	
25,500	51,000	.003667	.000734	....	....	
26,000	52,000	.004433	.000766	....	....	
26,500	53,000	.005333	.000900	....	....	
27,000	54,000	.006100	.000767	....	....	
27,500	55,000	.006833	.000733	....	....	
44,060	88,120	....	....	....	....	Ultimate strength.

Failed by triple flexure.

8 inch steel B. L. Rifle

Jacket

Muzzle



H Ex No 16 50, 1.

No. 3130.

Marks, $\substack{\text{8 R}_1\text{ J}\\ \text{M T}_1\text{ I}}$
Diameter, ″564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000700	.000200	0.	....	
6,250	25,000	.000833	.000133	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001533	.000200	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001767	.000067	....	....	
13,000	52,000	.001867	.000100	....	....	
13,250	53,000	.001933	.000066	....	....	
13,500	54,000	.002033	.000100	....	....	Elastic limit.
13,750	55,000	.002200	.000167	....	....	
14,000	56,000	.002433	.000233	....	....	
14,250	57,000	.002733	.000300	....	....	
14,500	58,000	.003167	.000134	....	....	
14,750	59,000	.003700	.000533	....	....	
15,000	60,000	.004267	.000567	....	....	
15,500	62,000	.005833	.001566	....	....	
16,000	64,000	.007333	.001500	....	....	
16,500	66,000	.008867	.001534	....	....	
17,000	68,000	.010167	.001300	....	....	
17,500	70,000	.011933	.001766	....	....	
18,000	72,000	.013433	.001500	....	....	
18,500	74,000	.015200	.001767	....	....	
19,000	76,000	.016967	.001767	....	....	
19,500	78,000	.018733	.001766	....	....	
20,000	80,000	.020600	.001867	....	....	
20,500	82,000	.022733	.002133	....	....	
21,000	84,000	.024867	.002134	....	....	
21,500	86,000	.027433	.002566	....	....	
22,000	88,000	.029867	.002434	....	....	
22,500	90,000	.032933	.003066	....	....	
23,000	92,000	.036000	.003067	....	....	
23,500	94,000	.0383	.0023	....	....	
24,000	96,000	.0417	.0034	....	....	
24,500	98,000	.0450	.0033	....	....	
25,000	100,000	.0533	.0083	....	....	
25,500	102,000	.0633	.0100	....	....	
26,000	104,000	.0733	.0100	....	....	
26,500	106,000	.0967	.0234	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	106,000
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.1067
Elongation per inch under strain at elastic limit	do....	.002033
Reduction in diameter at point of rupture	do....	.034
Reduction in area after rupture, per centum of original section		11.8
Position of rupture		1″.40 from neck

Character of broken surface, granular; dull spot radiating from circumference. Cracks in surface of stem.

Elongation of inch sections...″.08, ″.11*, ″.13

No. 3132.

Marks, $^{8\ R_1\ J}_{M\ T_2\ O}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	— .000033	— .000033	
2,500	10,000	.000233	.000133	— .000033	0.	
3,750	15,000	.000433	.000200	— .000033	0.	
5,000	20,000	.000600	.000167	— .000033	0.	
6,250	25,000	.000833	.000233	— .000033	0.	
7,500	30,000	.001000	.000167	0.	.000033	
8,750	35,000	.001167	.000167	0.	0.	
10,000	40,000	.001333	.000166	0.	0.	
11,250	45,000	.001533	.000200	....	....	
12,500	50,000	.001767	.000234	....	....	
12,750	51,000	.001833	.000066	....	....	
13,000	52,000	.001900	.000067	....	....	Elastic limit.
13,250	53,000	.002067	.000167	....	....	
13,500	54,000	.002367	.000300	....	....	
13,750	55,000	.002867	.000500	....	....	
14,000	56,000	.003400	.000533	....	....	
14,250	57,000	.004000	.000600	....	....	
14,500	58,000	.004667	.000667	....	....	
14,750	59,000	.005400	.000733	....	....	
15,000	60,000	.006167	.000767	....	....	
15,500	62,000	.007667	.001500	....	....	
16,000	64,000	.009200	.001533	....	....	
16,500	66,000	.010933	.001733	....	....	
17,000	68,000	.012600	.001667	....	....	
17,500	70,000	.014267	.001667	....	....	
18,000	72,000	.016167	.001900	....	....	
18,500	74,000	.017933	.001766	....	....	
19,000	76,000	.019933	.002000	....	....	
19,500	78,000	.021667	.001734	....	....	
20,000	80,000	.024233	.002566	....	....	
20,500	82,000	.026600	.002367	....	....	
21,000	84,000	.029167	.002567	....	....	
21,500	86,000	.032067	.002900	....	....	
22,000	88,000	.035167	.003100	....	....	
22,500	90,000	.0383	.003133	....	....	
23,000	92,000	.0417	.0034	....	....	
23,500	94,000	.0467	.0050	....	....	
24,000	96,000	.0533	.0066	....	....	
24,500	98,000	.0600	.0067	....	....	
25,000	100,000	.0700	.0100	....	....	
25,500	102,000	.0933	.0233	....	....	
25,800	103,200	.1333	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 103,200
Elastic limit per square inch of original section..........do.... 52,000
Elongation per inch after rupture..........inch.. 0.1467
Elongation per inch under strain at elastic limit..........do.... .001900
Reduction in diameter at point of rupture..........do.... .074
Reduction in area after rupture, per centum of original section.......... 24.6
Position of rupture..........''.80 from neck
Character of broken surface..........granular; dull spot at circumference
Elongation of inch sections..........''.10, ''.15, ''.19*

No. 3133.

Marks, $^{8\ R,\ J}_{M\ T,\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	.000033	.000033	
11,250	45,000	.001533	.000200	....	....	
11,500	46,000	.001567	.000034	....	....	
11,750	47,000	.001600	.000033	....	....	
12,000	48,000	.001633	.000033	....	....	
12,250	49,000	.001733	.000100	....	....	
12,500	50,000	.001800	.000067	....	....	Elastic limit.
12,750	51,000	.001900	.000100	....	....	
13,000	52,000	.002100	.000200	....	....	
13,250	53,000	.002367	.000267	....	....	
13,500	54,000	.002767	.000400	....	....	
13,750	55,000	.003200	.000433	....	....	
14,000	56,000	.003733	.000533	....	....	
14,250	57,000	.004367	.000634	....	....	
14,500	58,000	.005000	.000633	....	....	
14,750	59,000	.005733	.000733	....	....	
15,000	60,000	.006400	.000667	....	....	
15,500	62,000	.008067	.001667	....	....	
16,000	64,000	.009600	.001533	....	....	
16,500	66,000	.011167	.001567	....	....	
17,000	68,000	.012933	.001766	....	....	
17,500	70,000	.014533	.001600	....	....	
18,000	72,000	.016533	.002000	....	....	
18,500	74,000	.018333	.001800	....	....	
19,000	76,000	.020267	.001934	....	....	
19,500	78,000	.022167	.001900	....	....	
20,000	80,000	.024333	.002166	....	....	
20,500	82,000	.026867	.002534	....	....	
21,000	84,000	.029500	.002633	....	....	
21,500	86,000	.032367	.002867	....	....	
22,000	88,000	.036000	.003633	....	....	
22,500	90,000	.0383	.0023	....	....	
23,000	92,000	.0417	.0034	....	....	
23,500	94,000	.0467	.0050	....	....	
24,000	96,000	.0567	.0100	....	....	
24,500	98,000	.0633	.0066	....	....	
25,000	100,000	.0700	.0067	....	....	
25,500	102,000	.0900	.0200	....	....	
25,900	103,600	.1433	.0533	....	....	Tensile strength.

General summary.

Specific gravity	7.8533
Hardness	21.05
Tensile strength per square inch of original section ... pounds	103,600
Elastic limit per square inch of original section ... do	50,000
Elongation per inch after rupture ... inch	0.1633
Elongation per inch under strain at elastic limit ... do	.001800
Reduction in diamater at point of rupture ... do	.064
Reduction in area after rupture, per centum of original section	21.4
Position of rupture	1″.10 from neck
Character of broken surface	granular; dull spot at circumference
Elongation of inch sections	″.16*, ″.19, ″.14

No. 722.

Marks, $^{8\ R_1\ J}_{M\ T_4\ I}$
Length, 4″.5
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000167	.000100	0.	....	
7,500	15,000	.000300	.000133	0.	....	
10,000	20,000	.000467	.000167	0.	....	
12,500	25,000	.000633	.000166	0.	....	
15,000	30,000	.000800	.000167	0.	....	
17,500	35,000	.000967	.000167	0.	....	
20,000	40,000	.001133	.000166	0.	....	
22,500	45,000	.001300	.000167	....	....	
23,000	46,000	.001333	.000033	....	....	
23,500	47,000	.001400	.000067	....	....	
24,000	48,000	.001433	.000033	....	....	
24,500	49,000	.001467	.000034	....	....	
25,000	50,000	.001500	.000033	....	....	
25,500	51.000	.001567	.000067	....	....	
26,000	52,000	.001000	.000033	....	....	
26,500	53,000	.001667	.000067	....	....	
27,000	54,000	.001733	.000066	....	....	
27,500	55,000	.001767	.000034	....	....	
28,000	56,000	.001833	.000066	....	....	
28,500	57,000	.001867	.000034	....	....	Elastic limit.
29,000	58,000	.002000	.000133	....	....	
29,500	59,000	.002200	.000200	....	....	
30,000	60,000	.002300	.000100	....	....	
30,500	61,000	.003000	.000700	....	....	
31,000	62,000	.003467	.000467	....	....	
31,500	63,000	.004067	.000600	....	....	
32,000	64,000	.004667	.000600	....	....	
32,500	65,000	.005333	.000666	....	....	
33,000	66,000	.005967	.000634	....	....	
33,500	67,000	.006600	.000633	....	....	
54,600	109,200	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 723.

Marks, $\overset{8\,\mathrm{R,\,J}}{\mathrm{M\,T,\,O}}$

Length, 4″.5.

Diameter, ″.799.

Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	,000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40.000	.001267	.000167	0.	....	
20,500	41,000	.001300	.000033	....	....	
21,000	42,000	.001333	.000033	....	....	
21,500	43,000	.001367	.000034	....	....	
22,000	44,000	.001400	.000033	....	....	
22,500	45,000	.001433	.000033	....	....	
23,000	46,000	.001467	.000034	....	....	
23,500	47,000	.001500	.000033	....	....	
24,000	48,000	.001533	.000033	....	....	
24,500	49,000	.001567	.000034	....	....	
25,000	50,000	.001600	.000033	....	....	
25,500	51,000	.001633	.000033	....	....	Elastic limit.
26,000	52,000	.001733	.000100	....	....	
26,500	53,000	.001833	.000100	....	....	
27,000	54,000	.001933	.000100	....	....	
27,500	55,000	.002167	.000234	....	....	
28,000	56.000	.002400	.000233	....	....	
28,500	57.000	.002500	.000100	....	....	
29.000	58,000	.002900	.000400	....	....	
29,500	59,000	.003333	.000433	....	....	
30,000	60,000	.003900	.000567	....	....	
30,500	61,000	.005933	.002033	....	....	
31,000	62,000	.006600	.000667	....	....	
52,200	104,400	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 724.

Marks, $\overset{8\ R,\ J}{M\ T.\ M}$
Length, 4″.5.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000233	.000166	0.	....	
7,500	15,000	.000400	.000167	0.	....	
10,000	20,000	.000533	.000133	0.	....	
12,500	25,000	.000700	.000167	0.	....	
15,000	30,000	.000867	.000167	0.	....	
17,500	35,000	.001033	.000166	0.	....	
20,000	40,000	.001233	.000200	0.	....	
20,500	41,000	.001267	.000034	....	....	
21,000	42,000	.001300	.000033	....	....	
21,500	43,000	.001367	.000067	....	....	
22,000	44,000	.001400	.000033	....	....	
22,500	45,000	.001433	.000033	....	....	
23,000	46,000	.001500	.000067	....	....	
23,500	47,000	.001533	.000033	....	....	
24,000	48,000	.001600	.000067	....	....	
24,500	49,000	.001667	.000067	....	....	Elastic limit.
25,000	50,000	.001767	.000100	....	....	
25,500	51,000	.001933	.000166	....	....	
26,000	52,000	.002167	.000234	....	....	
26,500	53,000	.002467	.000300	....	....	
27,000	54,000	.002833	.000366	....	....	
27,500	55,000	.003167	.000334	....	....	
28,000	56,000	.003667	.000500	....	....	
28,500	57,000	.004100	.000433	....	....	
29,000	58,000	.004567	.000467	....	....	
29,500	59,000	.005167	.000600	....	....	
30,000	60,000	.005400	.000233	....	....	
30,500	61,000	.006333	.000933	....	....	
31,000	62,000	.006900	.000567	....	....	
51,400	102,800	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 725.

Marks, $\frac{8\ R,\ J}{M\ R}$
Length, 4″.77.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40,000	.001267	.000167	0.	....	
20,500	41,000	.001300	.000033	....	....	
21,000	42,000	.001333	.000033	....	....	
21,500	43,000	.001367	.000034	....	....	
22,000	44,000	.001400	.000033	....	....	
22,500	45,000	.001433	.000033	....	....	
23,000	46,000	.001500	.000067	....	....	
23,500	47,000	.001533	.000033	....	....	
24,000	48,000	.001600	.000067	....	....	
24,500	49,000	.001633	.000033	....	....	
25,000	50,000	.001700	.000067	....	....	Elastic limit.
25,500	51,000	.001833	.000133	....	....	
26,000	52,000	.002000	.000167	....	....	
26,500	53,000	.002233	.000233	....	....	
27,000	54,000	.002500	.000267	....	....	
27,500	55,000	.002767	.000267	....	....	
28,000	56,000	.003100	.000333	....	....	
28,500	57,000	.003667	.000567	....	....	
29,000	58,000	.004167	.000500	....	....	
29,500	59,000	.004800	.000633	....	....	
30,000	60,000	.005333	.000533	....	....	
30,500	61,000	.005900	.000567	....	....	
31,000	62,000	.006500	.000600	....	....	
31,500	63,000	.007167	.000067	....	....	
51,800	103,600	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 726.

Marks, $^{S\,R,\,J}_{M\,R}$
Length, 4".74.
Diameter, ".798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40,000	.001267	.000167	0.	....	
20,500	41,000	.001333	.000066	....	....	
21,000	42,000	.001367	.000034	....	....	
21,500	43,000	.001400	.000033	....	....	
22,000	44,000	.001433	.000033	....	....	
22,500	45,000	.001467	.000034	....	....	
23,000	46,000	.001500	.000033	....	....	
23,500	47,000	.001567	.000067	....	....	
24,000	48,000	.001633	.000066	....	....	
24,500	49,000	.001667	.000034	....	....	Elastic limit.
25,000	50,000	.002000	.000333	....	....	
25,500	51,000	.002333	.000333	....	....	
26,000	52,000	.002833	.000500	....	....	
26,500	53,000	.003500	.000667	....	....	
27,000	54,000	.004100	.000600	....	....	
27,500	55,000	.004633	.000533	....	....	
28,000	56,000	.005167	.000534	....	....	
28,500	57,000	.005767	.000600	....	....	
29,000	58,000	.006333	.000566	....	....	
29,500	59,000	.007000	.000667	....	....	
30,000	60,000	.007633	.000633	....	....	
49,900	99,800	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 3159.

Marks, $^{8\ R_1\ J}_{M\ T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001367	.000167	0.	....	
11,250	45,000	.001567	.000200	....	....	Elastic limit.
11,500	46,000	.001700	.000133	....	....	
11,750	47,000	.001767	.000067	....	....	
12,000	48,000	.001933	.000166	....	....	
12,250	49,000	.002367	.000434	....	....	
12,500	50,000	.003700	.001333	....	....	
12,750	51,000	.004267	.000567	....	....	
13,000	52,000	.005200	.000933	....	....	
13,250	53,000	.005833	.000633	....	....	
13,500	54,000	.006667	.000834	....	....	
13,750	55,000	.007333	.000666	....	....	
14,000	56,000	.008233	.000900	....	....	
14,250	57,000	.009133	.000900	....	....	
14,500	58,000	.010133	.001000	....	....	
14,750	59,000	.011333	.001200	....	....	
15,000	60,000	.012000	.000667	....	....	
15,500	62,000	.013033	.001033	....	....	
16,000	64,000	.015133	.002100	....	....	
16,500	66,000	.017000	.001867	....	....	
17,000	68,000	.019167	.002167	....	....	
17,500	70,000	.021267	.002100	....	....	
18,000	72,000	.023333	.002066	....	....	
18,500	74,000	.025833	.002500	....	....	
19,000	76,000	.028467	.002634	....	....	
19,500	78,000	.031600	.003133	....	....	
20,000	80,000	.034600	.003000	....	....	
20,500	82,000	.038267	.003667	....	....	
21,000	84,000	.042333	.004066	....	....	
21,500	86,000	.047500	.005167	....	....	
22,000	88,000	.052733	.005233	....	....	
22,500	90,000	.0600	.007267	....	....	
23,000	92,000	.0700	.0100	....	....	
23,500	94,000	.0867	.0167	....	....	
23,980	95,920	.1233	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.................................pounds..	95,920
Elastic limit per square inch of original section.................................do....	45,000
Elongation per inch after rupture.................................inch..	0.1833
Elongation per inch under strain at elastic limit.................................do....	.001567
Reduction in diameter at point of rupture.................................do....	.104
Reduction in area after rupture, per centum of original section.................................	33.5
Position of rupture.................................	1″.50 from neck
Character of broken surface.................................	granular, 70 per cent.; silky, 30 per cent.
Elongation of inch sections.................................	″.13, ″.26*, ″.16

No. 3160.

Marks, $\overset{8}{\text{M}}\ \overset{\text{R,}}{\text{T}_{10}}\ \overset{\text{J}}{\text{I}}$
Diameter ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000467	.000200	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000833	.000200	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001367	.000200	0.	....	
11, 250	45, 000	.001533	.000166	....	....	
11, 500	46, 000	.001567	.000034	....	....	
11, 750	47, 000	.001600	.000033	....	....	
12, 000	48, 000	.001667	.000067	....	....	
12, 250	49, 000	.001700	.000033	....	....	
12, 500	50, 000	.001733	.000033	....	....	
12, 750	51, 000	.001800	.000067	....	....	Elastic limit.
13, 000	52, 000	.002067	.000267	....	....	
13, 250	53, 000	.002400	.000333	....	....	
13, 500	54, 000	.002833	.000433	....	....	
13, 750	55, 000	.003367	.000534	....	....	
14, 000	56, 000	.004267	.000900	....	....	
14, 250	57, 000	.005033	.000766	....	....	
14, 500	58, 000	.005933	.000900	....	....	
14, 750	59, 000	.006667	.000734	....	....	
15, 000	60, 000	.007467	.000800	....	....	
15, 500	62, 000	.009200	.001733	....	....	
16, 000	64, 000	.010933	.001733	....	....	
16, 500	66, 000	.012700	.001767	....	....	
17, 000	68, 000	.014500	.001800	....	....	
17, 500	70, 000	.016100	.001600	....	....	
18, 000	72, 000	.018067	.001967	....	....	
18, 500	74, 000	.020000	.001933	....	....	
19, 000	76, 000	.022167	.002167	....	....	
19, 500	78, 000	.024400	.002233	....	....	
20, 000	80, 000	.026767	.002367	....	....	
20, 500	82, 000	.029600	.002833	....	....	
21, 000	84, 000	.032667	.003067	....	....	
21, 500	86, 000	.035833	.003166	....	....	
22, 000	88, 000	.039167	.003634	....	....	
22, 500	90, 000	.043667	.004200	....	....	
23, 000	92, 000	.048700	.005033	....	....	
23, 500	94, 000	.0567	.0080	....	....	
24, 000	96, 000	.0633	.0066	....	....	
24, 500	98, 000	.0733	.0100	....	....	
25, 000	100, 000	.1000	.0267	....	....	
25, 180	100, 720	.1233	.02[illegible]	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 100, 720
Elastic limit per square inch of original section ....do.... 51, 000
Elongation per inch after rupture ....inch.. 0. 1533
Elongation per inch under strain at elastic limit ....do.... .001800
Reduction in diameter at point of rupture ....do.... .054
Reduction in area after rupture, per centum of original section 18. 3
Position of rupture ....1″.20 from neck
Character of broken surface ....granular, radiating from a point in the circumference
Minimum diameter 1″ from point of rupture ....″.50
Elongation of inch sections ....″.15, ″.17*, ″.14

No. 3161.

Marks, $\overset{8\ B,\ J}{M\ T_{11}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000183	0.	....	
2, 500	10, 000	.000333	.000200	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10,000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001533	.000200	....	....	
11, 500	46, 000	.001567	.000034	....	....	
11, 750	47, 000	.001633	.000066	....	....	
12, 000	48, 000	.001667	.000034	....	....	
12, 250	49, 000	.001700	.000033	....	....	Elastic limit.
12, 500	50, 000	.001833	.000133	....	....	
12, 750	51, 000	.002067	.000234	....	....	
13, 000	52, 000	.002733	.000666	....	....	
13, 250	53, 000	.003500	.000767	....	....	
13, 500	54, 000	.004467	.000967	....	....	
13, 750	55, 000	.005200	.000733	....	....	
14, 000	56, 000	.006100	.000900	....	....	
14, 250	57, 000	.006767	.000607	....	....	
14, 500	58, 000	.007700	.000933	....	....	
14, 750	59, 000	.008467	.000767	....	....	
15, 000	60, 000	.009400	.000933	....	....	
15, 500	62, 000	.011200	.001800	....	....	
16, 000	64, 000	.013000	.001800	....	....	
16, 500	66, 000	.014833	.001833	....	....	
17, 000	68, 000	.016667	.001834	....	....	
17, 500	70, 000	.018700	.002033	....	....	
18, 000	72, 000	.020667	.001967	....	....	
18, 500	74, 000	.023200	.002533	....	....	
19, 000	76, 000	.025333	.002133	....	....	
19, 500	78, 000	.028167	.002834	....	....	
20, 000	80, 000	.031033	.002866	....	....	
20, 500	82, 000	.034167	.003134	....	....	
21, 000	84, 000	.037833	.003666	....	....	
21, 500	86, 000	.042333	.004500	....	....	
22, 000	88, 000	.046667	.004334	....	....	
22, 500	90, 000	.052167	.005500	....	....	
23, 000	92, 000	.0600	.007833	....	....	
23, 500	94, 000	.0700	.0100	....	....	
24, 000	96, 000	.0833	.0133	....	....	
24, 380	97, 520	.1167	.0334	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	97, 520
Elastic limit per square inch of original section	do ...	49, 000
Elongation per inch after rupture	inch..	0. 1400
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section		18. 3
Position of rupture		1″.35 from neck
Character of broken surface		granular, radiating from a dull spot in the circumference
Elongation of inch sections		″.12, ″.19, ″.11

No. 3162.

Marks, $^{8\ R_1\ J}_{M\ T_{11}\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001367	.000167	0.	....	
11,250	45,000	.001533	.000166	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001800	.000067	....	....	Elastic limit.
13,250	53,000	.002033	.000233	....	....	
13,500	54,000	.003467	.001434	....	....	
13,750	55,000	.004167	.000700	....	....	
14,000	56,000	.005233	.001066	....	....	
14,250	57,000	.005933	.000700	....	....	
14,500	58,000	.006767	.000834	....	....	
14,750	59,000	.007400	.000633	....	....	
15,000	60,000	.008367	.000967	....	....	
15,500	62,000	.010167	.001800	....	....	
16,000	64,000	.012000	.001833	....	....	
16,500	66,000	.013900	.001900	....	....	
17,000	68,000	.015600	.001700	....	....	
17,500	70,000	.017600	.002000	....	....	
18,000	72,000	.019833	.002233	....	....	
18,500	74,000	.022000	.002167	....	....	
19,000	76,000	.024167	.002167	....	....	
19,500	78,000	.026667	.002500	....	....	
20,000	80,000	.029267	.002600	....	....	
20,500	82,000	.032333	.003066	....	....	
21,000	84,000	.035667	.003334	....	....	
21,500	86,000	.039167	.003500	....	....	
22,000	88,000	.043333	.004166	....	....	
22,500	90,000	.048733	.005400	....	....	
23,000	92,000	.0533	.004567	....	....	
23,500	94,000	.0633	.0100	....	....	
24,000	96,000	.0700	.0067	....	....	
24,500	98,000	.0933	.0233	....	....	
24,660	98,640	.1167	.0234	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	98,640
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1533
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.70 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.23*, ″.14, ″.09

No. 3357.

Marks, ${}^{S\,R,\,J}_{M\,T_{12}\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	....	....	
2,500	10,000	.000300	.000200	....	....	
3,750	15,000	.000467	.000167	....	....	
5,000	20,000	.000633	.000166	....	....	
6,250	25,000	.000833	.000200	....	....	
7,500	30,000	.000967	.000134	....	....	
8,750	35,000	.001133	.000166	....	....	
10,000	40,000	.001333	.000200	....	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001400	0.	....	....	
11,000	44,000	.001467	.000067	....	....	
11,250	45,000	.001533	.000066	....	....	
11,500	46,000	.001600	.000067	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001700	.000067	....	....	
12,250	49,000	.001733	.000033	....	....	Elastic limit.
12,500	50,000	.001867	.000134	....	....	
12,750	51,000	.002033	.000166	....	....	
13,000	52,000	.002600	.000567	....	....	
13,250	53,000	.003267	.000667	....	....	
13,500	54,000	.004067	.000800	....	....	
13,750	55,000	.005000	.000933	....	....	
14,000	56,000	.005767	.000767	....	....	
14,250	57,000	.006667	.000900	....	....	
14,500	58,000	.007500	.000833	....	....	
14,750	59,000	.008333	.000833	....	....	
15,000	60,000	.009167	.000834	....	....	
15,500	62,000	.010833	.001666	....	....	
16,000	64,000	.012667	.001834	....	....	
16,500	66,000	.014500	.001833	....	....	
17,000	68,000	.016333	.001833	....	....	
17,500	70,000	.018167	.001834	....	....	
18,000	72,000	.020233	.002066	....	....	
18,500	74,000	.022467	.002234	....	....	
19,000	76,000	.025000	.002533	....	....	
19,500	78,000	.027833	.002833	....	....	
20,000	80,000	.030500	.002667	....	....	
20,500	82,000	.033500	.003000	....	....	
21,000	84,000	.037333	.003833	....	....	
21,500	86,000	.040833	.003500	....	....	
22,000	88,000	.045833	.005000	....	....	
22,500	90,000	.051000	.005167	....	....	
23,000	92,000	.0600	.0090	....	....	
23,500	94,000	.0667	.0067	....	....	
24,000	96,000	.0833	.0166	....	....	
24,420	97,680	.1267	.0434	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	97,680
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do....	.001733
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1".22 from neck
Character of broken surface		silky; slightly granular at the circumference
Elongation of inch sections		".11. ".24*, ".22*

No. 3358.

Marks, $\overset{8\ R,\ J}{M\ T,\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	**Initial load.**
1, 250	5, 000	. 000167	. 000167	0.	....	
2, 500	10, 000	. 000333	. 000166	0.	....	
3, 750	15, 000	. 000500	. 000167	0.	....	
5, 000	20, 000	. 000667	. 000167	0.	....	
6, 250	25, 000	. 000833	. 000166	0.	....	
7, 500	30, 000	. 001000	. 000167	0.	....	
8, 750	35, 000	. 001200	. 000200	0.	....	
10, 000	40, 000	. 001333	. 000133	....	....	
10, 250	41, 000	. 001400	. 000067	....	....	
10, 500	42, 000	. 001433	. 000033	....	....	
10, 750	43, 000	. 001467	. 000034	....	....	
11, 000	44, 000	. 001533	. 000066	....	....	
11, 250	45, 000	. 001600	. 000067	....	....	
11, 500	46, 000	. 001633	. 000033	....	....	
11, 750	47, 000	. 001667	. 000034	....	....	**Elastic limit.**
12, 000	48, 000	. 001767	. 000100	....	....	
12, 250	49, 000	. 001900	. 000133	....	....	
12, 500	50, 000	. 002100	. 000200	....	....	
12, 750	51, 000	. 002333	. 000233	....	....	
13, 000	52, 000	. 003133	. 000800	....	....	
13, 250	53, 000	. 004000	. 000867	....	....	
13, 500	54, 000	. 004900	. 000900	....	....	
13, 750	55, 000	. 005733	. 000833	....	....	
14, 000	56, 000	. 006700	. 000967	....	....	
14, 250	57, 000	. 007400	. 000700	....	....	
14, 500	58, 000	. 008500	. 001100	....	....	
14, 750	59, 000	. 009200	. 000700	....	....	
15, 000	60, 000	. 010167	. 000967	....	....	
15, 500	62, 000	. 012033	. 001866	....	....	
16, 000	64, 000	. 013733	. 001700	....	....	
16, 500	66, 000	. 016100	. 002367	....	....	
17, 000	68, 000	. 018000	. 001900	....	....	
17, 500	70, 000	. 020067	. 002067	....	....	
18, 000	72, 000	. 022467	. 002400	....	....	
18, 500	74, 000	. 024933	. 002466	....	....	
19, 000	76, 000	. 027733	. 002800	....	....	
19, 500	78, 000	. 030567	. 002834	....	....	
20, 000	80, 000	. 033567	. 003000	....	....	
20, 500	82, 000	. 037333	. 003766	....	....	
21, 000	84, 000	. 041567	. 004234	....	....	
21, 500	86, 000	. 046700	. 005133	....	....	
22, 000	88, 000	. 0533	. 0066	....	....	
22, 500	90, 000	. 0633	. 0100	....	....	
23, 000	92, 000	. 0733	. 0100	....	....	
23, 500	94, 000	. 0967	. 0234	....	....	
23, 590	94, 360	. 1200	. 0233	....	....	**Tensile strength.**

General summary.

Tensile strength per square inch of original section	pounds..	94, 360
Elastic limit per square inch of original section	do	47, 000
Elongation per inch after rupture	inch..	0. 1567
Elongation per inch under strain at elastic limit	do....	. 001667
Reduction in diameter at point of rupture	do....	. 064
Reduction in area after rupture, per centum of original section		21. 4
Position of rupture		1″.70 from neck
Character of broken surface		granular, radiating from silky spot at the circumference
Diameter ½″ from rupture		″. 49
Elongation of inch sections		″. 13, ″. 24*, ″. 10

No. 3359.

Marks, $^{8\ R_1\ J}_{M\ T_{18}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	....	....	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	
11,000	44,000	.001433	.000033	....	....	
11,250	45,000	.001467	.000034	....	....	
11,500	46,000	.001533	.000066	....	....	Elastic limit.
11,750	47,000	.001633	.000100	....	....	
12,000	48,000	.002833	.001200	....	....	
12,250	49,000	.003767	.000934	....	....	
12,500	50,000	.004767	.001000	....	....	
12,750	51,000	.005467	.000700	....	....	
13,000	52,000	.006367	.000900	....	....	
13,250	53,000	.007033	.000666	....	....	
13,500	54,000	.007900	.000867	....	....	
13,750	55,000	.008600	.000700	....	....	
14,000	56,000	.009500	.000900	....	....	
14,250	57,000	.010533	.001033	....	....	
14,500	58,000	.011333	.000800	....	....	
14,750	59,000	.012100	.000767	....	....	
15,000	60,000	.013033	.000933	....	....	
15,500	62,000	.014900	.001867	....	....	
16,000	64,000	.016933	.002033	....	....	
16,500	66,000	.018900	.001967	....	....	
17,000	68,000	.021033	.002133	....	....	
17,500	70,000	.023367	.002334	....	....	
18,000	72,000	.025733	.002366	....	....	
18,500	74,000	.028567	.002834	....	....	
19,000	76,000	.031667	.003100	....	....	
19,500	78,000	.034833	.003166	....	....	
20,000	80,000	.03850	.003667	....	....	
20,500	82,000	.043000	.004500	....	....	
21,000	84,000	.047667	.004667	....	....	
21,500	86,000	.0567	.009033	....	....	
22,000	88,000	.0633	.0066	....	....	
22,500	90,000	.0733	.0100	....	....	
23,000	92,000	.0967	.0234	....	....	
23,230	92,920	.1333	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section........pounds..	92,920
Elastic limit per square inch of original section........do....	46,000
Elongation per inch after rupture........inch..	0.2000
Elongation per inch under strain at elastic limit........do....	.001533
Reduction in diameter at point of rupture........do....	.124
Reduction in area after rupture, per centum of original section........	39.2
Position of rupture........	1″.24 from neck
Character of broken surface........	silky; granular at circumference
Elongation of inch sections........	″.12, ″.24*, ″.29*

No. 740.

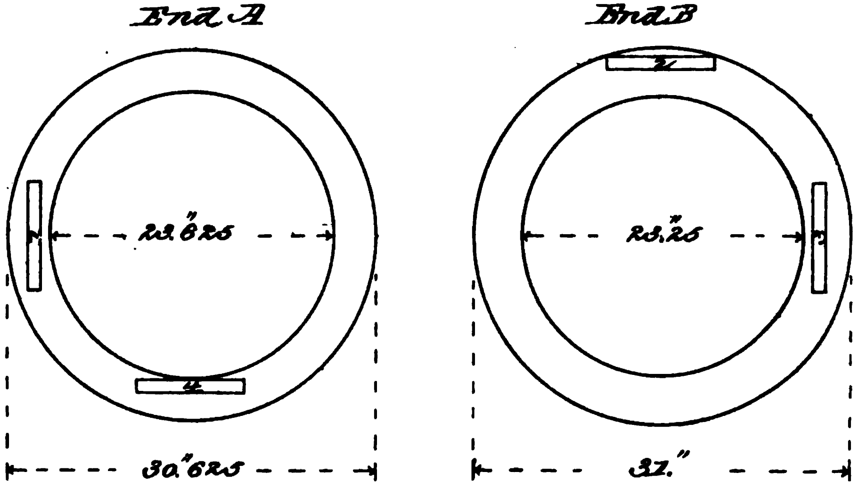
Marks, $\overset{S\,R_1\,J}{M\,T_{18}\,M}$
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000233	.000166	0.	....	
7,500	15,000	.000367	.000134	0.	....	
10,000	20,000	.000500	.000133	0.	....	
12,500	25,000	.000667	.000167	0.	....	
15,000	30,000	.000833	.000166	0.	....	
17,500	35,000	.001033	.000200	0.	....	
20,000	40,000	.001200	.000167	0.	....	
22,500	45,000	.001367	.000167	....	....	
23,000	46,000	.001400	.000033	....	....	Elastic limit.
23,500	47,000	.001000	.000200	....	....	
24,000	48,000	.002467	.000867	....	....	
24,500	49,000	.003433	.000966	....	....	
25,000	50,000	.004067	.000634	....	....	
25,500	51,000	.004767	.000700	....	....	
26,000	52,000	.005333	.000566	....	....	
26,500	53,000	.006000	.000667	....	....	
27,000	54,000	.006667	.000667	....	....	
27,500	55,000	.007400	.000733	....	....	
41,360	82,720	....	....	....	....	Ultimate strength.

Failed by triple flexure.

8 inch Steel B. L. Rifle

Hoop A1



HOOP A_1.

No. 2921.

Marks, $^{8R_1A_1}_{T_1M}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Tatal.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001317	.000184	0.		
11,250	45,000	.001483	.000166			
12,500	50,000	.001650	.000167			
12,750	51,000	.001700	.000050			
13,000	52,000	.001733	.000033			
13,250	53,000	.001767	.000034			
13,500	54,000	.001817	.000050			
13,750	55,000	.001883	.000066			Elastic limit.
14,000	56,000	.001967	.000084			
14,250	57,000	.002433	.000466			
14,500	58,000	.003383	.000950			
14,750	59,000	.003950	.000567			
15,000	60,000	.004517	.000567			
15,500	62,000	.005850	.001333			
16,000	64,000	.007167	.001317			
16,500	66,000	.008417	.001250			
17,000	68,000	.009833	.001416			
17,500	70,000	.011017	.001184			
18,000	72,000	.012417	.001400			
18,500	74,000	.013917	.001500			
19,000	76,000	.015283	.001366			
19,500	78,000	.017000	.001717			
20,000	80,000	.019000	.002000			
20,500	82,000	.020633	.001633			
21,000	84,000	.022000	.001367			
21,500	86,000	.024000	.002000			
22,000	88,000	.026000	.002000			
22,500	90,000	.028333	.002333			
23,000	92,000	.030433	.002100			
23,500	94,000	.0333	.002867			
24,000	96,000	.0367	.0034			
24,500	98,000	.0400	.0033			
25,000	100,000	.0433	.0033			
25,500	102,000	.0483	.0050			
26,000	104,000	.0533	.0050			
26,500	106,000	.0633	.0100			
27,000	108,000	.0767	.0134			
27,430	109,720	.1133	.0366			Tensile strength.

General summary.

Specific gravity		7.8527
Hardness		23.84
Tensile strength per square inch of original section	pounds	109,720
Elastic limit per square inch of original section	do.	55,000
Elongation per inch after rupture	inch	0.1617
Elongation per inch under strain at elastic limit	do.	.001883
Reduction in diameter at point of rupture	do.	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1''.55 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		''.10, ''.13, ''.13, ''.15, ''.33*, ''.18

No. 2922.

Marks, $^{8}\frac{E_1\,A_1}{T_2\,O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000483	.000200	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001750	.000050	....	....	
13,250	53,000	.001800	.000050	....	....	
13,500	54,000	.001833	.000033	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001917	.000050	....	....	
14,250	57,000	.001967	.000050	....	....	Elastic limit.
14,500	58,000	.002133	.000166	....	....	
14,750	59,000	.002500	.000367	....	....	
15,000	60,000	.003217	.000717	....	....	
15,500	62,000	.004383	.001166	....	....	
16,000	64,000	.005667	.001284	....	....	
16,500	66,000	.006883	.001216	....	....	
17,000	68,000	.008333	.001415	....	....	
17,500	70,000	.009583	.001250	....	....	
18,000	72,000	.010967	.001384	....	....	
18,500	74,000	.012333	.001366	....	....	
19,000	76,000	.013617	.001284	....	....	
19,500	78,000	.015167	.001550	....	....	
20,000	80,000	.016783	.001616	....	....	
20,500	82,000	.018333	.001550	....	....	
21,000	84,000	.020000	.001667	....	....	
21,500	86,000	.021867	.001867	....	....	
22,000	88,000	.023667	.001800	....	....	
22,500	90,000	.025750	.002083	....	....	
23,000	92,000	.028167	.002417	....	....	
23,500	94,000	.030667	.002500	....	....	
24,000	96,000	.033250	.002583	....	....	
24,500	98,000	.0367	.003450	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0450	.0050	....	....	
26,000	104,000	.0483	.0033	....	....	
26,500	106,000	.0550	.0067	....	....	
27,000	108,000	.0633	.0083	....	....	
27,500	110,000	.0750	.0117	....	....	
27,860	111,440	.1050	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	111,440
Elastic limit per square inch of original section	do	57,000
Elongation per inch after rupture	inch	0.1400
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		at middle of stem
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.12, ″.23*, ″.20*, ″.11, ″.16

No. 2923.

Marks, $\frac{8\ B_1\ A_1}{T_3\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	—.000017	—.000017	
2,500	10,000	.000283	.000166	—.000017	0.	
3,750	15,000	.000450	.000167	—.000017	0.	
5,000	20,000	.000617	.000167	—.000017	0.	
6,250	25,000	.000783	.000166	—.000017	0.	
7,500	30,000	.000950	.000167	—.000017	0.	
8,750	35,000	.001117	.000167	—.000017	0.	
10,000	40,000	.001283	.000166	—.000017	0.	
11,250	45,000	.001450	.000167	....	....	
12,500	50,000	.001617	.000167	....	....	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001700	.000050	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001783	.000016	....	....	
14,000	56,000	.001817	.000034	....	....	
14,250	57,000	.001883	.000066	....	....	Elastic limi
14,500	58,000	.001967	.000084	....	....	
14,750	59,000	.002233	.000266	....	....	
15,000	60,000	.003017	.000784	....	....	
15,500	62,000	.004333	.001316	....	....	
16,000	64,000	.005500	.001167	....	....	
16,500	66,000	.006667	.001167	....	....	
17,000	68,000	.007917	.001250	....	....	
17,500	70,000	.009250	.001333	....	....	
18,000	72,000	.010667	.001417	....	....	
18,500	74,000	.011883	.001216	....	....	
19,000	76,000	.013250	.001367	....	....	
19,500	78,000	.014667	.001417	....	....	
20,000	80,000	.016233	.001566	....	....	
20,500	82,000	.017700	.001467	....	....	
21,000	84,000	.019417	.001717	....	....	
21,500	86,000	.021167	.001750	....	....	
22,000	88,000	.023000	.001833	....	....	
22,500	90,000	.024917	.001917	....	....	
23,000	92,000	.027083	.002166	....	....	
23,500	94,000	.029117	.002034	....	....	
24,000	96,000	.0317	.002583	....	....	
24,500	98,000	.0350	.0033	....	....	
25,000	100,000	.0383	.0033	....	....	
25,500	102,000	.0417	.0034	....	....	
26,000	104,000	.0467	.0050	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0583	.0066	....	....	
27,500	110,000	.0700	.0117	....	....	
28,000	112,000	.1000	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	112,000
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		3¼" from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".09, ".12, ".27*, ".19, ".10, ".09

No. 2924.

Marks, $^{8}\frac{R_1\,A_1}{T_4\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

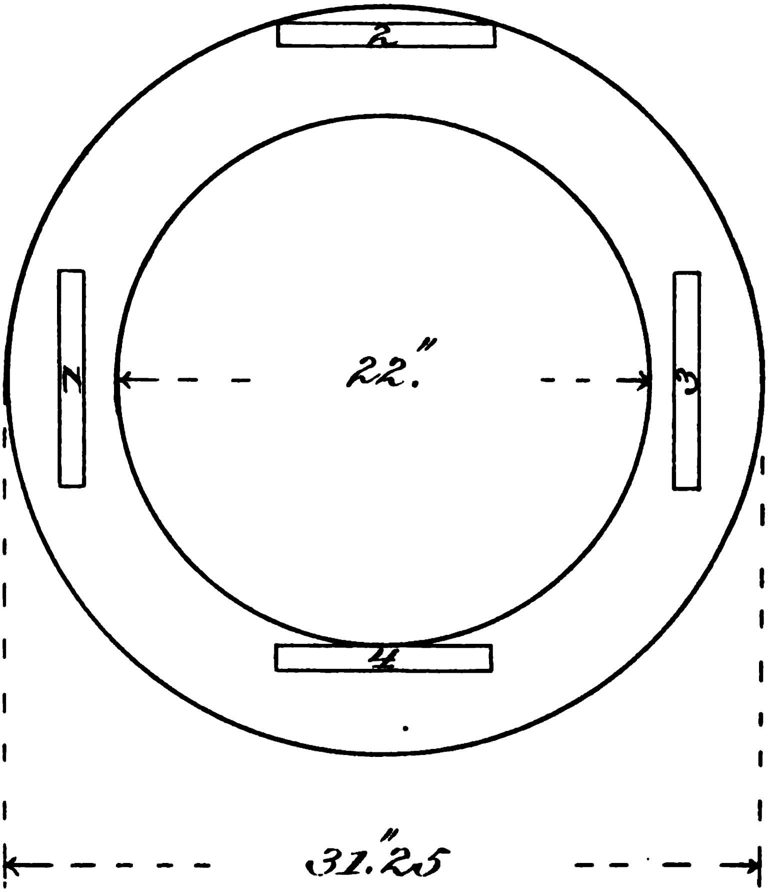
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001783	.000050	....	....	
13,500	54,000	.001800	.000017	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001950	.000050	....	....	
14,750	59,000	.001983	.000033	....	....	
15,000	60,000	.002017	.000034	....	....	
15,250	61,000	.002007	.000050	....	....	
15,500	62,000	.002117	.000050	....	....	
15,750	63,000	.002133	.000016	....	....	Elastic limit.
16,000	64,000	.002200	.000067	....	....	
16,250	65,000	.002283	.000083	....	....	
16,500	66,000	.002450	.000167	....	....	
16,750	67,000	.002617	.000167	....	....	
17,000	68,000	.003117	.000500	....	....	
17,250	69,000	.003700	.000583	....	....	
17,500	70,000	.004500	.000800	....	....	
18,000	72,000	.006000	.001500	....	....	
18,500	74,000	.007667	.001667	....	....	
19,000	76,000	.009033	.001366	....	....	
19,500	78,000	.010583	.001550	....	....	
20,000	80,000	.012000	.001417	....	....	
20,500	82,000	.013533	.001533	....	....	
21,000	84,000	.015000	.001467	....	....	
21,500	86,000	.016667	.001667	....	....	
22,000	88,000	.018333	.001666	....	....	
22,500	90,000	.020000	.001667	....	....	
23,000	92,000	.021833	.001833	....	....	
23,500	94,000	.024000	.002167	....	....	
24,000	96,000	.025917	.001917	....	....	
24,500	98,000	.028333	.002416	....	....	
25,000	100,000	.030700	.002367	....	....	
25,500	102,000	.0333	.0026	....	....	
26,000	104,000	.0367	.0034	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0450	.0050	....	....	
27,500	110,000	.0500	.0050	....	....	
28,000	112,000	.0567	.0067	....	....	
28,500	114,000	.0667	.0100	....	....	
29,000	116,000	.0883	.0216	....	....	
29,040	116,160	.1000	.0117	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	116,160
Elastic limit per square inch of original section	do....	63,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.002133
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1".55 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".09, ".09, ".09, ".11, ".30, ".14

8 inch Steel B. L. Rifle

Hoop A3



H Ex No 16 50, 1.

HOOP A_3.

No. 3118.

Marks, $\frac{8\,\mathrm{R}}{\mathrm{T}},\frac{\mathrm{A}_3}{\mathrm{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000317	.000150	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001750	.000050	....	....	
13,250	53,000	.001767	.000017	....	....	
13,500	54,000	.001817	.000050	....	....	
13,750	55,000	.001850	.000033	....	....	Elastic limit.
14,000	56,000	.001983	.000083	....	....	
14,250	57,000	.002000	.000067	....	....	
14,500	58,000	.002250	.000250	....	....	
14,750	59,000	.002567	.000317	....	....	
15,000	60,000	.003383	.000816	....	....	
15,500	62,000	.004533	.001150	....	....	
16,000	64,000	.005533	.001000	....	....	
16,500	66,000	.006783	.001250	....	....	
17,000	68,000	.007967	.001184	....	....	
17,500	70,000	.009200	.001233	....	....	
18,000	72,000	.010533	.001383	....	....	
18,500	74,000	.011950	.001417	....	....	
19,000	76,000	.013200	.001250	....	....	
19,500	78,000	.014750	.001550	....	....	
20,000	80,000	.016250	.001500	....	....	
20,500	82,000	.017917	.001667	....	....	
21,000	84,000	.019467	.001550	....	....	
21,500	86,000	.021250	.001783	....	....	
22,000	88,000	.023033	.001783	....	....	
22,500	90,000	.025000	.001967	....	....	
23,000	92,000	.027250	.002250	....	....	
23,500	94,000	.029600	.002350	....	....	
24,000	96,000	.031800	.002200	....	....	
24,500	98,000	.0350	.0032	....	....	
25,000	100,000	.0383	.0033	....	....	
25,500	102,000	.0433	.0050	....	....	
26,000	104,000	.0467	.0034	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0583	.0066	....	....	
27,500	110,000	.0683	.0100	....	....	
28,000	112,000	.0883	.0200	....	....	
28,040	112,160	.1000	.0117	....	....	Tensile strength.

General summary.

Specific gravity	7.8516
Hardness	23.84
Tensile strength per square inch of original section ....pounds..	112,160
Elastic limit per square inch of original section ....do ...	55,000
Elongation per inch after rupture ....inch..	0.1300
Elongation per inch under strain at elastic limit ....do....	.001850
Reduction in diameter at point of rupture ....do....	.094
Reduction in area after rupture, per centum of original section	30.6
Position of rupture	1″.60 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.07, ″.09, ″.11, ″.12, ″.28*, ″.11

No. 3119.

Marks, $\overset{8\,R_1\,A_3}{T_3\,O}$

Diameter, ''.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000483	.000183	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001167	.000184	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001483	.000150	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001717	.000017	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001850	.000050	....	....	
14,000	56,000	.001900	.000050	....	....	
14,250	57,000	.001933	.000033	....	....	
14,500	58,000	.001967	.000034	....	....	Elastic limit.
14,750	59,000	.002100	.000133	....	....	
15,000	60,000	.002517	.000417	....	....	
15,500	62,000	.003383	.000266	....	....	
16,000	64,000	.004467	.001084	....	....	
16,500	66,000	.005500	.001033	....	....	
17,000	68,000	.006633	.001133	....	....	
17,500	70,000	.007867	.001234	....	....	
18,000	72,000	.009033	.001166	....	....	
18,500	74,000	.010333	.001300	....	....	
19,000	76,000	.011667	.001334	....	....	
19,500	78,000	.013283	.001616	....	....	
20,000	80,000	.014833	.001550	....	....	
20,500	82,000	.016500	.001667	....	....	
21,000	84,000	.018000	.001500	....	....	
21,500	86,000	.019500	.001500	....	....	
22,000	88,000	.020917	.001417	....	....	
22,500	90,000	.022017	.001700	....	....	
23,000	92,000	.024583	.001966	....	....	
23,500	94,000	.026667	.002084	....	....	
24,000	96,000	.029167	.002500	....	....	
24,500	98,000	.031167	.002000	....	....	
25,000	100,000	.0333	.002133	....	....	
25,500	102,000	.0367	.0034	....	....	
26,000	104,000	.0400	.0033	....	....	
26,500	106,000	.0450	.0050	....	....	
27,000	108,000	.0517	.0067	....	....	
27,500	110,000	.0567	.0050	....	....	
28,000	112,000	.0667	.0100	....	....	
28,500	114,000	.0833	.0166	....	....	
28,600	114,400	.0967	.0134	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	114,400
Elastic limit per square inch of original section	do ...	58,000
Elongation per inch after rupture	inch..	0.1183
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1''.70 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		''.07, ''.07, ''.10, ''.11, ''.25*, ''.11

No. 3120.

Marks, $^{8\,R_1\,A_8}_{T_3\,M}$.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000683	.000183	0.	....	
6,250	25,000	.000850	.000167	0.	....	
7,500	30,000	.001017	.000167	0.	....	
8,750	35,000	.001183	.000166	0.	....	
10,000	40,000	.001367	.000184	.000017	.000017	
11,250	45,000	.001533	.000166	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001817	.000034	....	....	
13,500	54,000	.001867	.000050	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001950	.000050	....	....	Elastic limit.
14,250	57,000	.002467	.000517	....	....	
14,500	58,000	.003433	.000966	....	....	
14,750	59,000	.003967	.000534	....	....	
15,000	60,000	.004583	.000616	....	....	
15,500	62,000	.005500	.000917	....	....	
16,000	64,000	.006667	.001167	....	....	
16,500	66,000	.007833	.001166	....	....	
17,000	68,000	.009083	.001250	....	....	
17,500	70,000	.010333	.001250	....	....	
18,000	72,000	.011667	.001334	....	....	
18,500	74,000	.013083	.001416	....	....	
19,000	76,000	.014667	.001584	....	....	
19,500	78,000	.016167	.001500	....	....	
20,000	80,000	.017800	.001633	....	....	
20,500	82,000	.019167	.001367	....	....	
21,000	84,000	.020833	.001666	....	....	
21,500	86,000	.022633	.001800	....	....	
22,000	88,000	.024667	.002034	....	....	
22,500	90,000	.026417	.001750	....	....	
23,000	92,000	.028667	.002250	....	....	
23,500	94,000	.031083	.002416	....	....	
24,000	96,000	.033500	.002417	....	....	
24,500	98,000	.0367	.0032	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0467	.0067	....	....	
26,000	104,000	.0517	.0050	....	....	
26,500	106,000	.0567	.0050	....	....	
27,000	108,000	.0633	.0066	....	....	
27,500	110,000	.0767	.0134	....	....	
27,850	111,400	.1050	.0283	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,400
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.1300
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.17 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.09, ″.10, ″.11, ″.20*, ″.21*

No. 3121.

Marks, $^{8}\frac{R_1 A_8}{T_4 I}$
Diameter, ''.564.
Sectional area, .25 square inch.

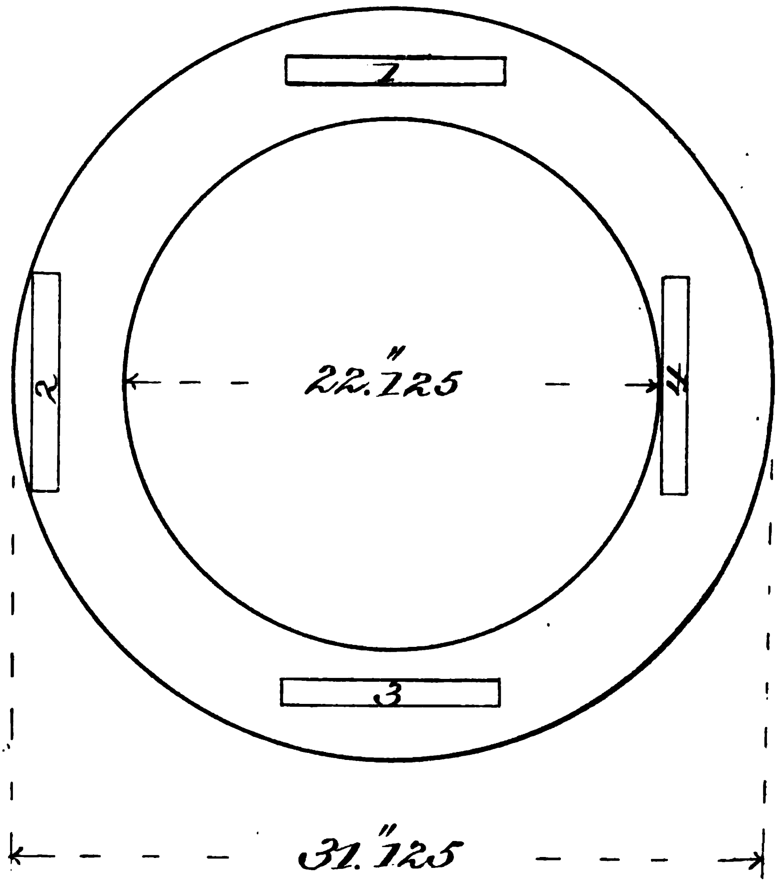
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001733	.000050	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001817	.000017	....	....	
14,000	56,000	.001867	.000050	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001950	.000050	....	....	
14,750	59,000	.001983	.000033	....	....	Elastic limit.
15,000	60,000	.002067	.000084	....	....	
15,250	61,000	.002267	.000200	....	....	
15,500	62,000	.002867	.000600	....	....	
16,000	64,000	.004167	.001300	....	....	
16,500	66,000	.005333	.001166	....	....	
17,000	68,000	.006417	.001084	....	....	
17,500	70,000	.007417	.001000	....	....	
18,000	72,000	.008583	.001166	....	....	
18,500	74,000	.009917	.001334	....	....	
19,000	76,000	.011083	.001166	....	....	
19,500	78,000	.012617	.001534	....	....	
20,000	80,000	.014500	.002083	....	....	
20,500	82,000	.016000	.001500	....	....	
21,000	84,000	.017467	.001467	....	....	
21,500	86,000	.018583	.001116	....	....	
22,000	88,000	.020000	.001417	....	....	
22,500	90,000	.021667	.001667	....	....	
23,000	92,000	.023917	.002250	....	....	
23,500	94,000	.026417	.002500	....	....	
24,000	96,000	.028333	.001916	....	....	
24,500	98,000	.030500	.002167	....	....	
25,000	100,000	.032917	.002417	....	....	
25,500	102,000	.035833	.002916	....	....	
26,000	104,000	.039000	.003167	....	....	
26,500	106,000	.0433	.0043	....	....	
27,000	108,000	.0467	.0034	....	....	
27,500	110,000	.0533	.0066	....	....	
28,000	112,000	.0650	.0117	....	....	
28,500	114,000	.0733	.0083	....	....	
29,000	116,000	.0900	.0167	....	....	
29,080	116,320	.1033	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	116,320
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.001983
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		0''.70 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		''.24*, ''.12, ''.10, ''.08, ''.09, ''.09

8 inch Steel B. L. Rifle

Hoop A 4



HOOP A_4.

76

No. 3188.

Marks, $\genfrac{}{}{0pt}{}{8\,R_1\,A_4}{T_1\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.0 0317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001167	.000184	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
11,500	46,000	.001533	.000033	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001617	.000050	....	....	
12,250	49,000	.001667	.000050	....	....	Elastic limit.
12,500	50,000	.001917	.000250	....	....	
12,750	51,000	.002267	.000350	....	....	
13,000	52,000	.003417	.001150	....	....	
13,250	53,000	.003833	.000416	....	....	
13,500	54,000	.004500	.000667	....	....	
13,750	55,000	.004950	.000450	....	....	
14,000	56,000	.005600	.000650	....	....	
14,250	57,000	.006133	.000533	....	....	
14,500	58,000	.006767	.000634	....	....	
14,750	59,000	.007333	.000566	....	....	
15,000	60,000	.008167	.000834	....	....	
15,500	62,000	.009667	.001500	....	....	
16,000	64,000	.011250	.001583	....	....	
16,500	66,000	.012333	.001083	....	....	
17,000	68,000	.014000	.001667	....	....	
17,500	70,000	.015500	.001500	....	....	
18,000	72,000	.017250	.001750	....	....	
18,500	74,000	.019083	.001833	....	....	
19,000	76,000	.020750	.001667	....	....	
19,500	78,000	.022617	.001867	....	....	
20,000	80,000	.024917	.002500	....	....	
20,500	82,000	.027167	.002250	....	....	
21,000	84,000	.029583	.002417	....	....	
21,500	86,000	.0333	.003717	....	....	
22,000	88,000	.0358	.0025	....	....	
22,500	90,000	.0383	.0025	....	....	
23,000	92,000	.0433	.0050	....	....	
23,500	91,000	.0483	.0050	....	....	
24,000	96,000	.0533	.0050	....	....	
24,500	98,000	.0633	.0100	....	....	
25,000	100,000	.0717	.0084	....	....	
25,500	102,000	.0950	.0233	....	....	
25,660	102,640	.1050	.0100	....	....	Tensile strength.

General summary.

Specific gravity	7.8540
Hardness	21.17
Tensile strength per square inch of original section....pounds..	102,640
Elastic limit per square inch of original section....do....	49,000
Elongation per inch after rupture....inch..	0.1517
Elongation per inch under strain at elastic limit....do....	.001667
Reduction in diameter at point of rupture....do....	.114
Reduction in area after rupture, per centum of original section	30.4
Position of rupture	2″.55 from neck
Character of broken surface	silky; interspersed with granular metal at the circumference
Elongation of inch sections	″.11,″.18,″.29*,″.14.″.11,″.08

No. 3189.

Marks, $^{8\,R_1\,A_4}_{T_3\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
11,500	46,000	.001500	.000017	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001583	.000050	....	....	
12,250	49,000	.001617	.000034	....	....	
12,500	50,000	.001650	.000033	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001767	.000050	....	....	
13,500	54,000	.001817	.000050	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	Elastic limit.
14,250	57,000	.001950	.000067	....	....	
14,500	58,000	.002033	.000083	....	....	
14,750	59,000	.002100	.000067	....	....	
15,000	60,000	.002267	.000167	....	....	
15,250	61,000	.002533	.000266	....	....	
15,500	62,000	.003083	.000550	....	....	
16,000	64,000	.004217	.001134	....	....	
16,500	66,000	.005417	.001200	....	....	
17,000	68,000	.006867	.001450	....	....	
17,500	70,000	.008250	.001383	....	....	
18,000	72,000	.009583	.001333	....	....	
18,500	74,000	.011000	.001417	....	....	
19,000	76,000	.012517	.001517	....	....	
19,500	78,000	.014083	.001566	....	....	
20,000	80,000	.015583	.001500	....	....	
20,500	82,000	.017167	.001584	....	....	
21,000	84,000	.018667	.001500	....	....	
21,500	86,000	.020417	.001750	....	....	
22,000	88,000	.022367	.001950	....	....	
22,500	90,000	.024417	.002050	....	....	
23,000	92,000	.026667	.002250	....	....	
23,500	94,000	.029000	.002333	....	....	
24,000	96,000	.031417	.002417	....	....	
24,500	98,000	.034167	.002750	....	....	
25,000	100,000	.037667	.003500	....	....	
25,500	102,000	.0400	.002333	....	....	
26,000	104,000	.0467	.0067	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0600	.0083	....	....	
27,500	110,000	.0700	.0100	....	....	
28,000	112,000	.0950	.0250	....	....	
28,020	112,080	.1017	.0067	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 112,080
Elastic limit per square inch of original section..do.... 56,000
Elongation per inch after rupture...inch.. 0.1233
Elongation per inch under strain at elastic limit...do.... .00188
Reduction in diameter at point of rupture ....do.... .084
Reduction in area after rupture, per centum of original section 27.6
Position of rupture...1″.85 from neck
Character of broken surface...............................granular; silky spot at circumference
Elongation of inch sections ....″.08, ″.09, ″.11, ″.13, ″.23*, ″.10

No. 3190.

Marks, $^{8}\overset{R_1}{T_1}\overset{A_4}{M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000150	.000150	0.	....	
2, 500	10, 000	.000317	.000167	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000650	.000167	0.	....	
6, 250	25, 000	.000800	.000150	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001717	.000050	....	....	
13, 250	53, 000	.001750	.000033	....	....	
13, 500	54, 000	.001800	.000050	....	....	
13, 750	55, 000	.001867	.000067	....	....	Elastic limit.
14, 000	56, 000	.002117	.000250	....	....	
14, 250	57, 000	.002500	.000383	....	....	
14, 500	58, 000	.003100	.000600	....	....	
14, 750	59, 000	.003600	.000500	....	....	
15, 000	60, 000	.004417	.000817	....	....	
15, 500	62, 000	.005550	.001133	....	....	
16, 000	64, 000	.007000	.001450	....	....	
16, 500	66, 000	.008333	.001333	....	....	
17, 000	68, 000	.009667	.001334	....	....	
17, 500	70, 000	.011000	.001333	....	....	
18, 000	72, 000	.012417	.001417	....	....	
18, 500	74, 000	.014167	.001750	....	....	
19, 000	76, 000	.015750	.001583	....	....	
19, 500	78, 000	.017167	.001417	....	....	
20, 000	80, 000	.018833	.001666	....	....	
20, 500	82, 000	.020633	.001800	....	....	
21, 000	84, 000	.022617	.001984	....	....	
21, 500	86, 000	.024700	.002083	....	....	
22, 000	88, 000	.026867	.002167	....	....	
22, 500	90, 000	.029033	.002166	....	....	
23, 000	92, 000	.0333	.004267	....	....	
23, 500	94, 000	.0367	.0034	....	....	
24, 000	96, 000	.0400	.0033	....	....	
24, 500	98, 000	.0433	.0033	....	....	
25, 000	100, 000	.0483	.0050	....	....	
25, 500	102, 000	.0533	.0050	....	....	
26, 000	104, 000	.0617	.0084	....	....	
26, 500	106, 000	.0700	.0083	....	....	
26, 920	107, 680	.1017	.0317	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	107, 680
Elastic limit per square inch of original section	do....	55, 000
Elongation per inch after rupture	inch..	0. 1238
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		3″.20 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.09, ″.23*, ″.17, ″.11, ″.07

No. 3191.

Marks, $^{8}\frac{R_1 A_4}{T_4 I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10 000	.000317	.000217	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001700	.000200	....	....	
12,750	51,000	.001750	.000050	....	....	Elastic limit.
13,000	52,000	.001867	.000117	....	....	
13,250	53,000	.002033	.000166	....	....	
13,500	54,000	.002433	.000400	....	....	
13,750	55,000	.002817	.000384	....	....	
14,000	56,000	.003417	.000600	....	....	
14,250	57,000	.004000	.000583	....	....	
14,500	58,000	.004683	.000683	....	....	
14,750	50,000	.005183	.000500	....	....	
15,000	60,000	.005967	.000784	....	....	
15,500	62,000	.007433	.001466	....	....	
16,000	64,000	.008917	.001484	....	....	
16,500	66,000	.010500	.001583	....	....	
17,000	68,000	.011917	.001417	....	....	
17,500	70,000	.013433	.001516	....	....	
18,000	72,000	.015167	.001734	....	....	
18,500	74,000	.016867	.001700	....	....	
19,000	76,000	.018450	.001583	....	....	
19,500	88,000	.020400	.001950	....	....	
20,000	80,000	.022417	.002017	....	....	
20,500	82,000	.024667	.002250	....	....	
21,000	84,000	.026833	.002166	....	....	
21,500	86,000	.029417	.002584	....	....	
22,000	88,000	.0333	.003883	....	....	
22,500	90,000	.0358	.0025	....	....	
23,000	92,000	.0383	.0025	....	....	
23,500	94,000	.0433	.0050	....	....	
24,000	96,000	.0483	.0050	....	....	
24,500	98,000	.0533	.0050	....	....	
25,000	100,000	.0633	.0100	....	....	
25,500	102,000	.0750	.0117	....	....	
25,980	103,920	.1117	.0367	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	103,920
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1400
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		2″.50 from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		″.09, ″.17, ″.27*, ″.12, ″.10, ″.09

No. 3152.

Marks, $^{8\,R_1\,A_4}_{\;T_3\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000283	.000150	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000633	.000183	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001483	.000166	....	....	
11,500	46,000	.001517	.000034	....	....	
11,750	47,000	.001550	.000033	....	....	
12,000	48,000	.001600	.000050	....	....	
12,250	49,000	.001650	.000050	....	....	
12,500	50,000	.001700	.000050	....	....	Elastic limit.
12,750	51,000	.001800	.000100	....	....	
13,000	52,000	.001900	.000100	....	....	
13,250	53,000	.002017	.000117	....	....	
13,500	54,000	.002200	.000183	....	....	
13,750	55,000	.002417	.000217	....	....	
14,000	56,000	.002683	.000266	....	....	
14,250	57,000	.003000	.000617	....	....	
14,500	58,000	.003333	.000333	....	....	
14,750	59,000	.003833	.000500	....	....	
15,000	60,000	.004583	.000750	....	....	
15,500	62,000	.005933	.001350	....	....	
16,000	64,000	.007333	.001400	....	....	
16,500	66,000	.008750	.001417	....	....	
17,000	68,000	.010333	.001583	....	....	
17,500	70,000	.012000	.001667	....	....	
18,000	72,000	.013667	.001667	....	....	
18,500	74,000	.015167	.001500	....	....	
19,000	76,000	.016667	.001500	....	....	
19,500	78,000	.018500	.001833	....	....	
20,000	80,000	.020417	.001917	....	....	
20,500	82,000	.022417	.002000	....	....	
21,000	84,000	.024417	.002000	....	....	
21,500	86,000	.026617	.002200	....	....	
22,000	88,000	.029333	.002716	....	....	
22,500	90,000	.031500	.002167	....	....	
23,000	92,000	.0350	.0035	....	....	
23,500	94,000	.0383	.0033	....	....	
24,000	96,000	.0433	.0050	....	....	
24,500	98,000	.0483	.0050	....	....	
25,000	100,000	.0533	.0050	....	....	
25,500	102,000	.0600	.0067	....	....	
26,000	104,000	.0700	.0100	....	....	
26,490	105,960	.1017	.0317	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	105,960
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.1300
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		2″ from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.06, ″.07, ″.11, ″.14, ″.28*, ″.12

No. 3153.

Marks, $8\frac{E_1 A_4}{T_6 O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.		
2, 500	10, 000	.000333	.000166	0.		
3, 750	15, 000	.000500	.000167	0.		
5, 000	20, 000	.000683	.000183	0.		
6, 250	25, 000	.000867	.000184	0.		
7, 500	30, 000	.001050	.000183	0.		
8, 750	35, 000	.001217	.000167	0.		
10, 000	40, 000	.001400	.000183	0.		
11, 250	45, 000	.001567	.000167			
11, 500	46, 000	.001617	.000050			
11, 750	47, 000	.001650	.000033			
12, 000	48, 000	.001683	.000033			
12, 250	49, 000	.001717	.000034			
12, 500	50, 000	.001767	.000050			
12, 750	51, 000	.001800	.000033			
13, 000	52, 000	.001867	.000067			
13, 250	53, 000	.001917	.000050			
13, 500	54, 000	.001983	.000066			Elastic limit.
13, 750	55, 000	.002117	.000134			
14, 000	56, 000	.002233	.000116			
14, 250	57, 000	.002333	.000100			
14, 500	58, 000	.002567	.000234			
14, 750	59, 000	.002750	.000183			
15, 000	60, 000	.002917	.000167			
15, 500	62, 000	.003667	.000750			
16, 000	64, 000	.004500	.000833			
16, 500	66, 000	.005467	.000967			
17, 000	68, 000	.006433	.000966			
17, 500	70, 000	.007700	.001267			
18, 000	72, 000	.009000	.001300			
18, 500	74, 000	.010083	.001083			
19, 000	76, 000	.011417	.001334			
19, 500	78, 000	.013000	.001583			
20, 000	80, 000	.014583	.001583			
20, 500	82, 000	.016000	.001417			
21, 000	84, 000	.017417	.001417			
21, 500	86, 000	.019100	.001683			
22, 000	88, 000	.020917	.001817			
22, 500	90, 000	.022500	.001583			
23, 000	92, 000	.024500	.002000			
23, 500	94, 000	.026333	.001833			
24, 000	96, 000	.028667	.002334			
24, 500	98, 000	.031250	.002583			
25, 000	100, 000	.033333	.002083			
25, 500	102, 000	.0367	.003367			
26, 000	104, 000	.0417	.0050			
26, 500	106, 000	.0450	.0033			
27, 000	108, 000	.0500	.0050			
27, 500	110, 000	.0567	.0067			
28, 000	112, 000	.0650	.0083			
28, 410	113, 640	.0867	.0217			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	113, 640
Elastic limit per square inch of original section	do	54, 000
Elongation per inch after rupture	inch	0.0867
Elongation per inch under strain at elastic limit	do	.001983
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		2″.35 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.05, ″.05, ″.10, ″.19*, ″.09, ″.09

No. 3154.

Marks, $^{8}{}^{B_1}_{T_7}{}^{A_4}_{M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167	0.		
10,000	40,000	.001367	.000200	.000033	.000033	
11,250	45,000	.001533	.000166			Elastic limit.
11,500	46,000	.001617	.000084			
11,750	47,000	.001667	.000050			
12,000	48,000	.001783	.000116			
12,250	49,000	.001883	.000100			
12,500	50,000	.002117	.000234			
12,750	51,000	.002333	.000216			
13,000	52,000	.002533	.000200			
13,250	53,000	.002833	.000300			
13,500	54,000	.003167	.000334			
13,750	55,000	.003450	.000283			
14,000	56,000	.004000	.000550			
14,250	57,000	.004333	.000333			
14,500	58,000	.004850	.000517			
14,750	59,000	.005333	.000483			
15,000	60,000	.005950	.000617			
15,500	62,000	.007300	.001350			
16,000	64,000	.008600	.001300			
16,500	66,000	.009917	.001317			
17,000	68,000	.011333	.001416			
17,500	70,000	.012683	.001350			
18,000	72,000	.014267	.001584			
18,500	74,000	.015833	.001566			
19,000	76,000	.017417	.001584			
19,500	78,000	.019333	.001916			
20,000	80,000	.021083	.001750			
20,500	82,000	.023083	.002000			
21,000	84,000	.025333	.002250			
21,500	86,000	.027417	.002084			
22,000	88,000	.029833	.002416			
22,500	90,000	.032667	.002834			
23,000	92,000	.035333	.002666			
23,500	94,000	.0383	.002967			
24,000	96,000	.0433	.0050			
24,500	98,000	.0483	.0050			
25,000	100,000	.0533	.0050			
25,500	102,000	.0633	.0100			
26,000	104,000	.0750	.0117			
26,280	105,120	.0950	.0200			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105,120
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.1100
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		2″.75 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.05, ″.07, ″.11, ″.25*, ″.10, ″.08

NEW HOOP A₄.

No. 3362.

Marks, $^{8}\frac{R_1\,A_4}{T_3\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001100	.000150	—.000017	—.000017	
10,000	40,000	.001267	.000167	—.000017	0.	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001600	.000167	....	....	
12,750	51,000	.001617	.000017	....	....	
13,000	52,000	.001650	.000033	....	....	
13,250	53,000	.001683	.000033	....	....	
13,500	54,000	.001750	.000067	....	....	
13,750	55,000	.001783	.000033	....	....	
14,000	56,000	.001833	.000050	....	....	
14,250	57,000	.001867	.000034	....	....	Elastic limit.
14,500	58,000	.001983	.000116	....	....	
14,750	59,000	.002133	.000150	....	....	
15,000	60,000	.002533	.000400	....	....	
15,500	62,000	.003450	.000917	....	....	
16,000	64,000	.004583	.001133	....	....	
16,500	66,000	.005883	.001300	....	....	
17,000	68,000	.007083	.001200	....	....	
17,500	70,000	.008517	.001434	....	....	
18,000	72,000	.009833	.001316	....	....	
18,500	74,000	.011133	.001300	....	....	
19,000	76,000	.012500	.001367	....	....	
19,500	78,000	.014167	.001667	....	....	
20,000	80,000	.015633	.001466	....	....	
20,500	82,000	.017083	.001450	....	....	
21,000	84,000	.018667	.001584	....	....	
21,500	86,000	.020450	.001783	....	....	
22,000	88,000	.022167	.001717	....	....	
22,500	90,000	.024167	.002000	....	....	
23,000	92,000	.026250	.002083	....	....	
23,500	94,000	.0283	.002050	....	....	
24,000	96,000	.0317	.0034	....	....	
24,500	98,000	.0350	.0033	....	....	
25,000	100,000	.0383	.0033	....	....	
25,500	102,000	.0433	.0050	....	....	
26,000	104,000	.0467	.0034	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0567	.0050	....	....	
27,500	110,000	.0683	.0116	....	....	
27,890	111,560	.0967	.0284	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,560
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1283
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section	....	41.9
Position of rupture		1″.10 from neck
Character of broken surface		silky; granular at circumference
Elongation of inch sections		″.26*, ″.17, ″.11, ″.08, ″.08, ″.07

No. 3363.

Marks, $^{8}\frac{R_1}{T_9}\frac{A_4}{M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001450	.000150	....	....	
12,500	50,000	.001633	.000183	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001717	.000050	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	Elastic limit.
14,000	56,000	.001917	.000084	....	....	
14,250	57,000	.002000	.000083	....	....	
14,500	58,000	.002217	.000217	....	....	
14,750	59,000	.002400	.000183	....	....	
15,000	60,000	.002667	.000267	....	....	
15,500	62,000	.003483	.000816	....	....	
16,000	64,000	.004417	.000934	....	....	
16,500	66,000	.005700	.001283	....	....	
17,000	68,000	.006850	.001150	....	....	
17,500	70,000	.008083	.001233	....	....	
18,000	72,000	.009450	.001367	....	....	
18,500	74,000	.010167	.000717	....	....	
19,000	76,000	.011917	.001750	....	....	
19,500	78,000	.013283	.001366	....	....	
20,000	80,000	.014667	.001384	....	....	
20,500	82,000	.016200	.001533	....	....	
21,000	84,000	.017750	.001550	....	....	
21,500	86,000	.019283	.001533	....	....	
22,000	88,000	.021167	.001884	....	....	
22,500	90,000	.022917	.001750	....	....	
23,000	92,000	.024917	.002000	....	....	
23,500	94,000	.027167	.002250	....	....	
24,000	96,000	.029250	.002083	....	....	
24,500	98,000	.031750	.002500	....	....	
25,000	100,000	.035830	.004080	....	....	
25,500	102,000	.0383	.002470	....	....	
26,000	104,000	.0433	.0050	....	....	
26,500	106,000	.0467	.0034	....	....	
27,000	108,000	.0517	.0050	....	....	
27,500	110,000	.0617	.0100	....	....	
28,000	112,000	.0717	.0100	....	....	
28,260	113,040	.0950	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	113,040
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1167
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		3″.20 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.09, ″.26*, ″.14, ″.07, ″.07

No. 3364.

Marks, $^{8\,R_1\,A_4}_{T_{18}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000817	.000150	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001167	.000184	0.	....	
10,000	40,000	.001317	.000150	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001867	.000067	....	....	
14,000	56,000	.001917	.000050	....	....	
14,250	57,000	.001967	.000050	....	....	Elastic limit.
14,500	58,000	.002083	.000116	....	....	
14,750	59,000	.002233	.000150	....	....	
15,000	60,000	.002467	.000234	....	....	
15,500	62,000	.003167	.000700	....	....	
16,000	64,000	.004167	.001000	....	....	
16,500	66,000	.005383	.001166	....	....	
17,000	68,000	.006667	.001334	....	....	
17,500	70,000	.008083	.001416	....	....	
18,000	72,000	.009200	.001117	....	....	
18,500	74,000	.010500	.001300	....	....	
19,000	76,000	.011750	.001250	....	....	
19,500	78,000	.013267	.001517	....	....	
20,000	80,000	.014583	.001316	....	....	
20,500	82,000	.016083	.001500	....	....	
21,000	84,000	.017500	.001417	....	....	
21,500	86,000	.019133	.001633	....	....	
22,000	88,000	.020833	.001700	....	....	
22,500	90,000	.022600	.001767	....	....	
23,000	92,000	.024583	.001983	....	....	
23,500	94,000	.026667	.002084	....	....	
24,000	96,000	.028750	.002083	....	....	
24,500	98,000	.031000	.002250	....	....	
25,000	100,000	.0350	.0040	....	....	
25,500	102,000	.0383	.0033	....	....	
26,000	104,000	.0417	.0034	....	....	
26,500	106,000	.0450	.0033	....	....	
27,000	108,000	.0517	.0067	....	....	
27,500	110,000	.0600	.0083	....	....	
28,000	112,000	.0717	.0117	....	....	
28,420	113,680	.0833	.0116	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	113,680
Elastic limit per square inch of original section	...do....	57,000
Elongation per inch after rupture	inch..	0.1183
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section	..	33.5
Position of rupture		2″.75 from neck
Character of broken surface		granular; silky center.
Elongation of inch sections		″.07, ″.12, ″.27*, ″.10, ″.08, ″.07

No. 3365.

Marks, $\substack{8\,R_1\,A_4\\T_{11}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001467	.000150	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	Elastic limit.
13,000	52,000	.001733	.000066	....	....	
13,250	53,000	.001800	.000067	....	....	
13,500	54,000	.001883	.000083	....	....	
13,750	55,000	.001983	.000100	....	....	
14,000	56,000	.002300	.000317	....	....	
14,250	57,000	.002683	.000383	....	....	
14,500	58,000	.003167	.000484	....	....	
14,750	59,000	.003617	.000450	....	....	
15,000	60,000	.004133	.000516	....	....	
15,500	62,000	.005417	.001284	....	....	
16,000	64,000	.006667	.001250	....	....	
16,500	66,000	.007717	.001050	....	....	
17,000	68,000	.009000	.001283	....	....	
17,500	70,000	.010283	.001283	....	....	
18,000	72,000	.011583	.001300	....	....	
18,500	74,000	.013000	.001417	....	....	
19,000	76,000	.014217	.001217	....	....	
19,500	78,000	.015667	.001450	....	....	
20,000	80,000	.017000	.001338	....	....	
20,500	82,000	.018800	.001800	....	....	
21,000	84,000	.020633	.001833	....	....	
21,500	86,000	.022500	.001867	....	....	
22,000	88,000	.024417	.001917	....	....	
22,500	90,000	.026333	.001916	....	....	
23,000	92,000	.028500	.002167	....	....	
23,500	94,000	.030667	.002167	....	....	
24,000	96,000	.033167	.002500	....	....	
24,500	98,000	.0367	.003533	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0450	.0050	....	....	
26,000	104,000	.0500	.0050	....	....	
26,500	106,000	.0567	.0067	....	....	
27,000	108,000	.0667	.0100	....	....	
27,500	110,000	.0867	.0200	....	....	
27,600	110,400	.0983	.0116	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	110,400
Elastic limit per square inch of original section	do	51,000
Elongation per inch after rupture	inch	0.1233
Elongation per inch under strain at elastic limit	do	.001667
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2″.80 from neck
Character of broken surface		silky; interspersed with granular metal at circumference
Elongation of inch sections		″.08, ″.08, ″.11, ″.30*, ″.10, ″.07

HOOP A_4.

No. 3076.

Marks, $^{S\,R_1\,A_4}_{T_1\,M}$

Diameter, ″.564.

Sectional area, .25 square inch.

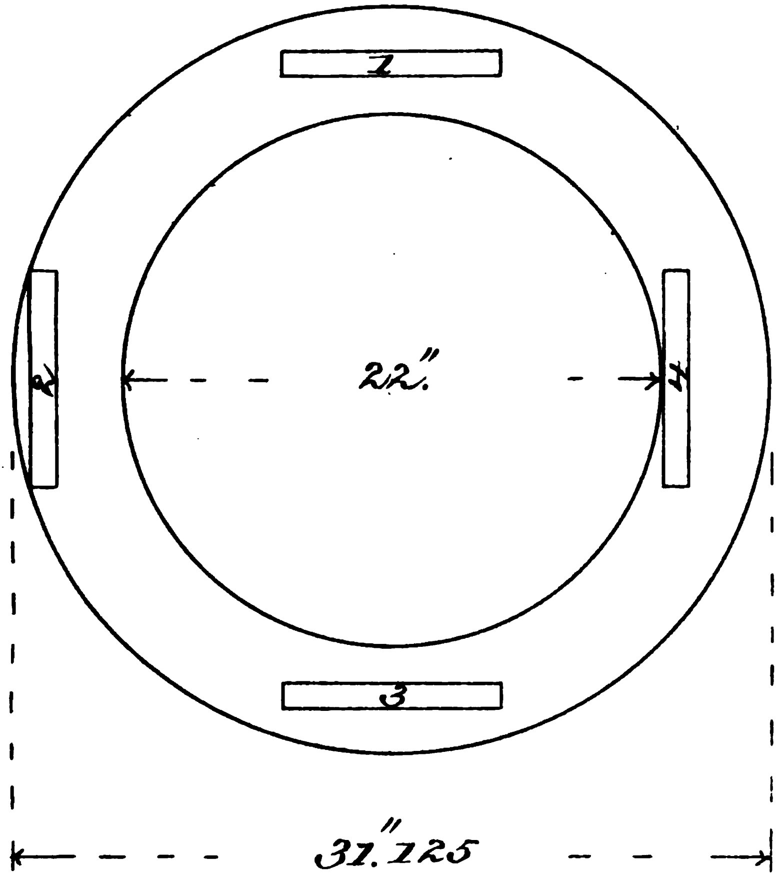
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000433	.000150	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001283	.000183	0.	....	
11,250	45,000	.001450	.000167	....	....	
12,500	50,000	.001633	.000183	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001750	.000050	....	....	Elastic limit.
13,500	54,000	.001833	.000083	....	....	
13,750	55,000	.001933	.000100	....	....	
14,000	56,000	.002100	.000167	....	....	
14,250	57,000	.002383	.000283	....	....	
14,500	58,000	.002833	.000450	....	....	
14,750	59,000	.003417	.000584	....	....	
15,000	60,000	.004250	.000833	....	....	
15,500	62,000	.005667	.001417	....	....	
16,000	64,000	.006867	.001200	....	....	
16,500	66,000	.008250	.001383	....	....	
17,000	68,000	.009667	.001417	....	....	
17,500	70,000	.011000	.001333	....	....	
18,000	72,000	.012367	.001367	....	....	
18,500	74,000	.013967	.001600	....	....	
19,000	76,000	.015500	.001533	....	....	
19,500	78,000	.017167	.001667	....	....	
20,000	80,000	.018800	.001633	....	....	
20,500	82,000	.020583	.001783	....	....	
21,000	84,000	.022500	.001917	....	....	
21,500	86,000	.024667	.002167	....	....	
22,000	88,000	.026750	.002083	....	....	
22,500	90,000	.029133	.002383	....	....	
23,000	92,000	.0333	.004167	....	....	
23,500	94,000	.0367	.0034	....	....	
24,000	96,000	.0400	.0033	....	....	
24,500	98,000	.0450	.0050	....	....	
25,000	100,000	.0500	.0050	....	....	
25,500	102,000	.0550	.0050	....	....	
26,000	104,000	.0617	.0067	....	....	
26,500	106,000	.0717	.0100	....	....	
27,000	108,000	.0983	.0266	....	....	
27,030	108,120	.1083	.0100	....	....	Tensile strength.

General summary.

Specific gravity	7.8528
Hardness	23.17
Tensile strength per square inch of original section ....pounds..	108,120
Elastic limit per square inch of original section ....do....	53,000
Elongation per inch after rupture ....inch..	0.1467
Elongation per inch under strain at elastic limit..........do....	.001750
Reduction in diameter at point of rupture..........do....	.104
Reduction in area after rupture, per centum of original section	33.5
Position of rupture	2″.70 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.09, ″.10, ″.14, ″.29*, ″.16, ″.10

8 inch Steel B. L. Rifle

Hoop A5



H Ex No 16 50, 1.

No. 3077.

Marks, $\overset{8\,R_1\,A_3}{T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150			
2,500	10,000	.000333	.000183			
3,750	15,000	.000483	.000150			
5,000	20,000	.000650	.000167			
6,250	25,000	.000833	.000183			
7,500	30,000	.001000	.000167			
8,750	35,000	.001183	.000183			
10,000	40,000	.001350	.000167			
11,250	45,000	.001517	.000167			
12,500	50,000	.001683	.000166			
12,750	51,000	.001717	.000034			
13,000	52,000	.001767	.000050			
13,250	53,000	.001817	.000050			
13,500	54,000	.001850	.000033			
13,750	55,000	.001900	.000050			
14,000	56,000	.001933	.000033			Elastic limit.
14,250	57,000	.002000	.000067			
14,500	58,000	.002083	.000083			
14,750	59,000	.002150	.000067			
15,000	60,000	.002317	.000167			
15,500	62,000	.002917	.000600			
16,000	64,000	.004000	.001083			
16,500	66,000	.005167	.001167			
17,000	68,000	.006417	.001250			
17,500	70,000	.007633	.001216			
18,000	72,000	.009000	.001367			
18,500	74,000	.010417	.001417			
19,000	76,000	.011833	.001416			
19,500	78,000	.013167	.001334			
20,000	80,000	.014750	.001583			
20,500	82,000	.016300	.001650			
21,000	84,000	.017683	.001383			
21,500	86,000	.019167	.001484			
22,000	88,000	.021067	.001900			
22,500	90,000	.022833	.001766			
23,000	92,000	.024833	.002000			
23,500	94,000	.027083	.002250			
24,000	96,000	.029250	.002167			
24,500	98,000	.0317	.002450			
25,000	100,000	.0358	.0041			
25,500	102,000	.0392	.0034			
26,000	104,000	.0433	.0041			
26,500	106,000	.0467	.0034			
27,000	108,000	.0517	.0050			
27,500	110,000	.0600	.0083			
28,000	112,000	.0700	.0100			
28,490	113,960	.1050	.0350			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	113,960
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.1283
Elongation per inch under strain at elastic limit	do....	.001933
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		2″.35 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.09, ″.10, ″.24, ″.18, ″.09

No. 3078.

Marks, $^{8}\begin{smallmatrix}\text{R, A,}\\ \text{T, M}\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000183	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	.000017	.000017	
11,250	45,000	.001533	.000183	....	....	
12,500	50,000	.001683	.000150	....	....	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001817	.000050	....	....	
13,500	54,000	.001850	.000033	....	....	Elastic limit.
13,750	55,000	.001933	.000083	....	....	
14,000	56,000	.002000	.000067	....	....	
14,250	57,000	.002167	.000167	....	....	
14,500	58,000	.002500	.000333	....	....	
14,750	59,000	.002867	.000367	....	....	
15,000	60,000	.003533	.000666	....	....	
15,500	62,000	.004700	.001167	....	....	
16,000	64,000	.005917	.001217	....	....	
16,500	66,000	.007167	.001250	....	....	
17,000	68,000	.008533	.001366	....	....	
17,500	70,000	.009750	.001217	....	....	
18,000	72,000	.011117	.001367	....	....	
18,500	74,000	.012450	.001333	....	....	
19,000	76,000	.013917	.001467	....	....	
19,500	78,000	.015500	.001583	....	....	
20,000	80,000	.017000	.001500	....	....	
20,500	82,000	.018617	.001617	....	....	
21,000	84,000	.020350	.001733	....	....	
21,500	86,000	.022167	.001817	....	....	
22,000	88,000	.024100	.001933	....	....	
22,500	90,000	.026417	.002317	....	....	
23,000	92,000	.028833	.002416	....	....	
23,500	94,000	.030867	.002034	....	....	
24,000	96,000	.033617	.002750	....	....	
24,500	98,000	.0367	.003083	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0467	.0067	....	....	
26,000	104,000	.0500	.0033	....	....	
26,500	106,000	.0567	.0067	....	....	
27,000	108,000	.0667	.0100	....	....	
27,500	110,000	.0833	.0166	....	....	
27,700	110,800	.1117	.0284	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	110,800
Elastic limit per square inch of original section	do ...	54,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		2″.90 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.09, ″.13, ″.29*, ″.13, ″.09

No. 3078½.

Marks, $^{8}\frac{E_1\,A_8}{T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000283	.000166	0.		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000617	.000167	0.		
6,250	25,000	.000783	.000166	0.		
7,500	30,000	.000967	.000184	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001317	.000184	.000017	.000017	
11,250	45,000	.001483	.000166			
12,500	50,000	.001650	.000167			
12,750	51,000	.001683	.000033			
13,000	52,000	.001750	.000067			
13,250	53,000	.001783	.000033			
13,500	54,000	.001817	.000034			
13,750	55,000	.001867	.000050			
14,000	56,000	.001900	.000033			
14,250	57,000	.001950	.000050			
14,500	58,000	.002000	.000050			
14,750	59,000	.002067	.000067			Elastic limit.
15,000	60,000	.002183	.000116			
15,250	61,000	.002417	.000234			
15,500	62,000	.002750	.000333			
16,000	64,000	.003750	.001000			
16,500	66,000	.004950	.001200			
17,000	68,000	.006250	.001300			
17,500	70,000	.007667	.001417			
18,000	72,000	.009000	.001333			
18,500	74,000	.010583	.001583			
19,000	76,000	.011867	.001284			
19,500	78,000	.013300	.001433			
20,000	80,000	.014867	.001567			
20,500	82,000	.016500	.001633			
21,000	84,000	.018000	.001500			
21,500	86,000	.019917	.001917			
22,000	88,000	.021583	.001666			
22,500	90,000	.023667	.002084			
23,000	92,000	.025833	.002166			
23,500	94,000	.028167	.002333			
24,000	96,000	.030750	.002583			
24,500	98,000	.0333	.002550			
25,000	100,000	.0367	.0034			
25,500	102,000	.0400	.0033			
26,000	104,000	.0450	.0050			
26,500	106,000	.0500	.0050			
27,000	108,000	.0550	.0050			
27,500	110,000	.0667	.0117			
28,000	112,000	.0850	.0183			
28,120	112,480	.1050	.0200			Tensile strength.

General summary.

Tensile strength per square inch of original section........pounds..	112,480
Elastic limit per square inch of original section........do ...	59,000
Elongation per inch after rupture........inch..	0.1317
Elongation per inch under strain at elastic limit........do ...	.002067
Reduction in diameter at point of rupture........do....	.104
Reduction in area after rupture, per centum of original section........	33.5
Position of rupture........	2″.35 from neck
Character of broken surface........	granular; silky center
Elongation of inch sections........	″.09, ″.19, ″.21*, ″.11, ″.10, ″.09

HOOP A_4.

No. 3079.

Marks, $\overset{8\,R_1\,A_4}{T_1\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

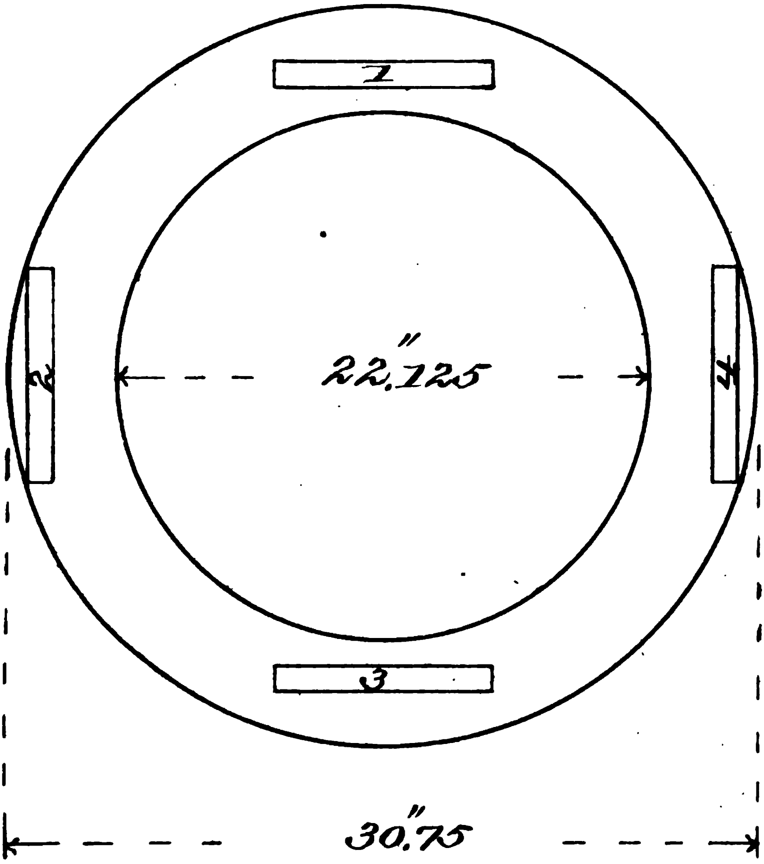
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000700	.000183	0.	....	
5,000	20,000	.000650	.000150	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001167	.000184	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001717	.000050	....	....	
13,000	52,000	.001750	.000033	....	....	
13,250	53,000	.001783	.000033	....	....	
13,500	54,000	.001817	.000034	....	....	
13,750	55,000	.001867	.000050	....	....	
14,000	56,000	.001917	.000050	....	....	
14,250	57,000	.001950	.000033	....	....	
14,500	58,000	.002000	.000050	....	....	
14,750	59,000	.002050	.000050	....	....	Elastic limit.
15,000	60,000	.002300	.000250	....	....	
15,250	61,000	.002733	.000433	....	....	
15,500	62,000	.003233	.000500	....	....	
16,000	64 000	.004283	.001050	....	....	
16,500	66,000	.005667	.001384	....	....	
17,000	68,000	.006833	.001166	....	....	
17,500	70,000	.008083	.001250	....	....	
18,000	72,000	.009400	.001317	....	....	
18,500	74,000	.010767	.001367	....	....	
19,000	76,000	.011950	.001183	....	....	
19,500	78,000	.013350	.001400	....	....	
20,000	80,000	.014917	.001567	....	....	
20,500	82,000	.016417	.001500	....	....	
21,000	84,000	.017933	.001516	....	....	
21,500	86,000	.019583	.001650	....	....	
22,000	88,000	.021167	.001584	....	....	
22,500	90,000	.023167	.002000	....	....	
23,000	92,000	.025200	.002033	....	....	
23,500	94,000	.027333	.002133	....	....	
24,000	96,000	.029667	.002334	....	....	
24,500	98,000	.032333	.002666	....	....	
25,000	100,000	.034700	.002367	....	....	
25,500	102,000	.0383	.0036	....	....	
26,000	104,000	.0417	.0034	....	....	
26,500	106,000	.0467	.0050	....	....	
27,000	108,000	.0533	.0066	....	....	
27,500	110,000	.0617	.0084	....	....	
28,000	112,000	.0700	.0083	....	....	
28,440	113,760	.0983	.0283	....	....	Tensile strength.

General summary.

Specific gravity		7.8511
Hardness		24.69
Tensile strength per square inch of original section	pounds	113,760
Elastic limit per square inch of original section	do	59,000
Elongation per inch after rupture	inch	0.1217
Elongation per inch under strain at elastic limit	do	.002050
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		at middle of stem
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.09, ″.23*, ″.17, ″.09, ″.07

8 inch steel B. L. Rifle

Hoop A 6



H Ex No 16 50, 1.

No. 3080.

Marks, $^{8\,R_1\,A_4}_{\;T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.009166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001017	.000184	0.	....	
8, 750	35, 000	.001200	.000183	.000017	.000017	
10, 000	40, 000	.001367	.000167	.000017	0.	
11, 250	45, 000	.001517	.000150	....	....	
12, 500	50, 000	.001683	.000166	....	....	
12, 750	51, 000	.001717	.000034	....	....	
13, 000	52, 000	.001767	.000050	....	....	
13, 250	53, 000	.001800	.000033	....	....	
13, 500	54, 000	.001833	.000033	....	....	
13, 750	55, 000	.001867	.000034	....	....	
14, 000	56, 000	.001917	.000050	....	....	
14, 250	57, 000	.001950	.000033	....	....	
14, 500	58, 000	.002000	.000050	....	....	
14, 750	59, 000	.002050	.000050	....	....	
15, 000	60, 000	.002100	.000050	....	....	
15, 250	61, 000	.002167	.000067	....	....	Elastic limit.
15, 500	62, 000	.002283	.000116	....	....	
15, 750	63, 000	.002533	.000250	....	....	
16, 000	64, 000	.003000	.000467	....	....	
16, 500	66, 000	.004117	.001117	....	....	
17, 000	68, 000	.005583	.001466	....	....	
17, 500	70, 000	.006867	.001284	....	....	
18, 000	72, 000	.008000	.001133	....	....	
18, 500	74, 000	.009333	.001333	....	....	
19, 000	76, 000	.010667	.001334	....	....	
19, 500	78, 000	.012083	.001416	....	....	
20, 000	80, 000	.013450	.001367	....	....	
20, 500	82, 000	.014917	.001467	....	....	
21, 000	84, 000	.016450	.001533	....	....	
21, 500	86, 000	.018017	.001567	....	....	
22, 000	88, 000	.019700	.001683	....	....	
22, 500	90, 000	.021333	.001633	....	....	
23, 000	92, 000	.023333	.002000	....	....	
23, 500	94, 000	.025333	.002000	....	....	
24, 000	96, 000	.027417	.002084	....	....	
24, 500	98, 000	.029667	.002250	....	....	
25, 000	100, 000	.032333	.002666	....	....	
25, 500	102, 000	.0367	.004367	....	....	
26, 000	104, 000	.0400	.0033	....	....	
26, 500	106, 000	.0433	.0033	....	....	
27, 000	108, 000	.0467	.0034	....	....	
27, 500	110, 000	.0517	.0050	....	....	
28, 000	112, 000	.0617	.0100	....	....	
28, 500	114, 000	.0717	.0100	....	....	
28, 890	115, 560	.1017	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	115, 560
Elastic limit per square inch of original section	do ...	61, 000
Elongation per inch after rupture	inch..	0. 1283
Elongation per inch under strain at elastic limit	do....	.002167
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		3″.10 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.10, ″.15, ″.25*, ″.11, ″.08

No. 3081.

Marks, $\frac{8\ R_1\ A_6}{T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000683	.000183	0.	....	
6,250	25,000	.000850	.000167	0.	....	
7,500	30,000	.001033	.000183	.000017	.000017	
8,750	35,000	.001200	.000167	.000017	0.	
10,000	40,000	.001383	.000183	.000033	.000016	
11,250	45,000	.001567	.000184	....	....	
12,500	50,000	.001733	.000166	....	....	
12,750	51,000	.001800	.000067	....	....	
13,000	52,000	.001817	.000017	....	....	
13,250	53,000	.001850	.000033	....	....	
13,500	54,000	.001883	.000033	....	....	
13,750	55,000	.001933	.000050	....	....	Elastic limit.
14,000	56,000	.002017	.000084	....	....	
14,250	57,000	.002117	.000100	....	....	
14,500	58,000	.002233	.000116	....	....	
14,750	59,000	.002400	.000167	....	....	
15,000	60,000	.002733	.000333	....	....	
15,500	62,000	.003583	.000850	....	....	
16,000	64,000	.004667	.001084	....	....	
16,500	66,000	.005833	.001166	....	....	
17,000	68,000	.007250	.001417	....	....	
17,500	70,000	.008500	.001250	....	....	
18,000	72,000	.009833	.001333	....	....	
18,500	74,000	.011133	.001300	....	....	
19,000	76,000	.012433	.001300	....	....	
19,500	78,000	.014000	.001567	....	....	
20,000	80,000	.015417	.001417	....	....	
20,500	82,000	.017000	.001583	....	....	
21,000	84,000	.018617	.001617	....	....	
21,500	86,000	.020417	.001800	....	....	
22,000	88,000	.022333	.001916	....	....	
22,500	90,000	.024167	.001834	....	....	
23,000	92,000	.026500	.002333	....	....	
23,500	94,000	.028750	.002250	....	....	
24,000	96,000	.031167	.002417	....	....	
24,500	98,000	.034000	.002833	....	....	
25,000	100,000	.037000	.003000	....	....	
25,500	102,000	.0400	.0030	....	....	
26,000	104,000	.0467	.0067	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0567	.0050	....	....	
27,500	110,000	.0650	.0083	....	....	
28,000	112,000	.0817	.0167	....	....	
28,180	112,720	.1050	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 112,720
Elastic limit per square inch of original section..........do... 55,000
Elongation per inch after rupture..........inch.. 0.1467
Elongation per inch under strain at elastic limit..........do.... .001933
Reduction in diamater at point of rupture..........do.... .034
Reduction in area after rupture, per centum of original section.......... 30.6
Position of rupture.......... 2″.15 from neck
Character of broken surface.......... granular; silky center
Elongation of inch sections..........″.11, ″.25*, ″.17, ″.13, ″.12, ″.10

No. 3082.

Marks, $^{8}\,\substack{R_1 \\ T_4}\,\substack{A_6 \\ I}$.
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000283	.000166	0.		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000617	.000167	0.		
6,250	25,000	.000783	.000166	0.		
7,500	30,000	.000983	.000200	0.		
8,750	35,000	.001150	.000167	0.		
10,000	40,000	.001333	.000183	.000017	.000017	
11,250	45,000	.001500	.000167			
12,500	50,000	.001700	.000200			
12,750	51,000	.001733	.000033			
13,000	52,000	.001767	.000034			
13,250	53,000	.001817	.000050			
13,500	54,000	.001850	.000033			
13,750	55,000	.001900	.000050			
14,000	56,000	.001950	.000050			
14,250	57,000	.001983	.000033			Elastic limit.
14,500	58,000	.002083	.000100			
14,750	59,000	.002167	.000084			
15,000	60,000	.002300	.000133			
15,500	62,000	.003000	.000700			
16,000	64,000	.004000	.001000			
16,500	66,000	.005333	.001333			
17,000	68,000	.006700	.001367			
17,500	70,000	.008250	.001550			
18,000	72,000	.009833	.001583			
18,500	74,000	.011250	.001417			
19,000	76,000	.012667	.001417			
19,500	78,000	.014167	.001500			
20,000	80,000	.015833	.001666			
20,500	82,000	.017417	.001584			
21,000	84,000	.019333	.001916			
21,500	86,000	.021333	.002000			
22,000	88,000	.023250	.001917			
22,500	90,000	.025333	.002083			
23,000	92,000	.027667	.002334			
23,500	94,000	.030333	.002666			
24,000	96,000	.033000	.002667			
24,500	98,000	.036000	.003000			
25,000	100,000	.039583	.003583			
25,500	102,000	.0450	.005417			
26,000	104,000	.0500	.0050			
26,500	106,000	.0550	.0050			
27,000	108,000	.0667	.0117			
27,500	110,000	.0867	.0200			
27,610	110,440	.1033	.0166			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	110,440
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch .	0.1267
Elongation per inch under strain at elastic limit	do....	.001983
Reduction in diameter at point of rupture	do....	.093
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1″.12 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.10, ″.12, ″.11, ″.17, ″.19*

HOOP A$_7$.

No. 3192.

Marks, $^{8\ R,\ A_7}_{T_1\ M}$

Diameter, ″.564.

Sectional area, .25 square inch.

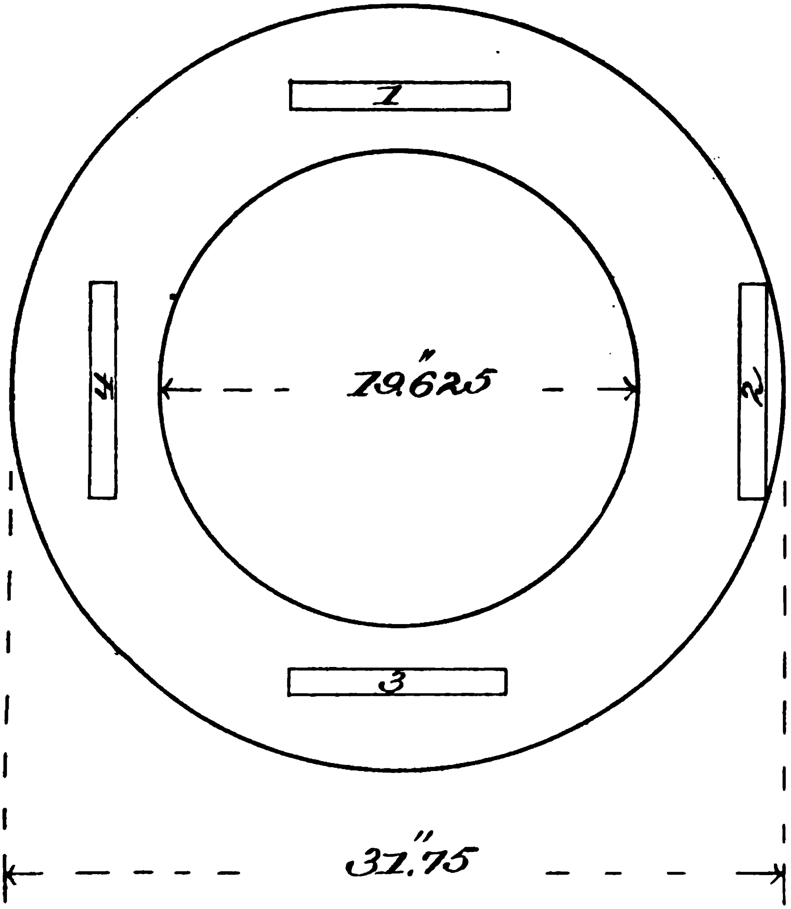
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000450	.000150	0.	....	
5, 000	20, 000	.000617	.000167	0.	....	
6, 250	25, 000	.000783	.000166	0.	....	
7, 500	30, 000	.000950	.000167	0.	....	
8, 750	35, 000	.001117	.000167	0.	....	
10, 000	40, 000	.001283	.000166	0.	....	
11, 250	45, 000	.001450	.000167	....	....	
11, 500	46, 000	.001483	.000033	....	....	
11, 750	47, 000	.001533	.000050	....	....	
12, 000	48, 000	.001583	.000050	....	....	
12, 250	49, 000	.001633	.000050	....	....	Elastic limit.
12, 500	50, 000	.001733	.000100	....	....	
12, 750	51, 000	.001833	.000100	....	....	
13, 000	52, 000	.002083	.000250	....	....	
13, 250	53, 000	.002250	.000167	....	....	
13, 500	54, 000	.002500	.000250	....	....	
13, 750	55, 000	.002733	.000233	....	....	
14, 000	56, 000	.003000	.000267	....	....	
14, 250	57, 000	.003333	.000333	....	....	
14, 500	58, 000	.003783	.000450	....	....	
14, 750	59, 000	.004217	.000434	....	....	
15, 000	60, 000	.004850	.000633	....	....	
15, 500	62, 000	.006250	.001400	....	....	
16, 000	64, 000	.007583	.001333	....	....	
16, 500	66, 000	.009000	.001417	....	....	
17, 000	68, 000	.010500	.001500	....	....	
17, 500	70, 000	.012333	.001833	....	....	
18, 000	72, 000	.013917	.001584	....	....	
18, 500	74, 000	.015500	.001583	....	....	
19, 000	76, 000	.017333	.001833	....	....	
19, 500	78, 000	.018917	.001584	....	....	
20, 000	80, 000	.020667	.001750	....	....	
20, 500	82, 000	.022750	.002083	....	....	
21, 000	84, 000	.025000	.002250	....	....	
21, 500	86, 000	.027333	.002333	....	....	
22, 000	88, 000	.029750	.002417	....	....	
22, 500	90, 000	.032500	.002750	....	....	
23, 000	92, 000	.035500	.003000	....	....	
23, 500	94, 000	.039167	.003667	....	....	
24, 000	96, 000	.0450	.005833	....	....	
24, 500	98, 000	.0517	.0067	....	....	
25, 000	100, 000	.0583	.0066	....	....	
25, 500	102, 000	.0650	.0067	....	....	
26, 000	104, 000	.0700	.0050	....	....	
26, 500	106, 000	.0950	.0250	....	....	
26, 600	106, 400	.1150	.0200	....	....	Tensile strength.

General summary.

Specific gravity		7. 8484
Hardness		21. 52
Tensile strength per square inch of original section	pounds..	106, 400
Elastic limit per square inch of original section	do ...	49, 000
Elongation per inch after rupture	inch..	0. 1333
Elongation per inch under strain at elastic limit	do....	.001633
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		2″. 50 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.10, ″.12, ″.24*, ″.16, ″.10

8 inch steel B. L. Rifle

Hoop A7



No. 3193.

Marks, $^{8}\frac{R_1\,A_7}{T_1\,O}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001500	.000183	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001717	.000050	....	....	
13,000	52,000	.001750	.000033	....	....	
13,250	53,000	.001783	.000033	....	....	
13,500	54,000	.001833	.000050	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001933	.000066	....	....	
14,250	57,000	.002000	.000067	....	....	
14,500	58,000	.002050	.000050	....	....	
14,750	59,000	.002083	.000033	....	....	Elastic limit.
15,000	60,000	.002200	.000117	....	....	
15,250	61,000	.002283	.000083	....	....	
15,500	62,000	.002433	.000150	....	....	
15,750	63,000	.002533	.000100	....	....	
16,000	64,000	.002733	.000200	....	....	
16,500	66,000	.003250	.000517	....	....	
17,000	68,000	.004083	.000833	....	....	
17,500	70,000	.005017	.000934	....	....	
18,000	72,000	.006100	.001083	....	....	
18,500	74,000	.007250	.001150	....	....	
19,000	76,000	.008583	.001333	....	....	
19,500	78,000	.009900	.001317	....	....	
20,000	80,000	.011300	.001400	....	....	
20,500	82,000	.012750	.001450	....	....	
21,000	84,000	.014167	.001417	....	....	
21,500	86,000	.015667	.001500	....	....	
22,000	88,000	.017183	.001516	....	....	
22,500	90,000	.018617	.001434	....	....	
23,000	92,000	.020583	.001966	....	....	
23,500	94,000	.022467	.001884	....	....	
24,000	96,000	.024417	.001950	....	....	
24,500	98,000	.026400	.001983	....	....	
25,000	100,000	.0283	.0019	....	....	
25,500	102,000	.0317	.0034	....	....	
26,000	104,000	.0350	.0033	....	....	
26,500	106,000	.0383	.0033	....	....	
27,000	108,000	.0417	.0034	....	....	
27,500	110,000	.0450	.0038	....	....	
28,000	112,000	.0483	.0033	....	....	
28,500	114,000	.0533	.0050	....	....	
29,000	116,000	.0633	.0100	....	....	
29,500	118,000	.0800	.0167	....	....	
29,660	118,640	.0983	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 118,640
Elastic limit per square inch of original section.................... do ... 59,000
Elongation per inch after rupture ....inch.. 0.1167
Elongation per inch under strain at elastic limit ....do.... .002083
Reduction in diameter at point of rupture ....do.... .084
Reduction in area after rupture, per centum of original section.................... 27.6
Position of rupture ....3''.25 from neck
Character of broken surface....................granular; silky center
Elongation of inch sections....................''.06, ''.09, ''.18*, ''.18*, ''.11, ''.06

No. 3194.

Marks, $^{8\,R_1\,A_7}_{\quad T_3\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001117	.000167	0.	....	
10,000	40,000	.001300	.000183	.000017	.000017	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001417	.000050	....	....	
11,000	44,000	.001450	.000033	....	....	Elastic limit.
11,250	45,000	.001533	.000083	....	....	
11,500	46,000	.001717	.000184	....	....	
11,750	47,000	.001850	.000133	....	....	
12,000	48,000	.002017	.000167	....	....	
12,250	49,000	.002133	.000116	....	....	
12,500	50,000	.002417	.000284	....	....	
12,750	51,000	.002667	.000250	....	....	
13,000	52,000	.002917	.000250	....	....	
13,250	53,000	.003400	.000483	....	....	
13,500	54,000	.003750	.000350	....	....	
13,750	55,000	.004250	.000500	....	....	
14,000	56,000	.004833	.000583	....	....	
14,250	57,000	.005417	.000584	....	....	
14,500	58,000	.006333	.000916	....	....	
14,750	59,000	.006950	.000617	....	....	
15,000	60,000	.007833	.000883	....	....	
15,500	62,000	.009433	.001600	....	....	
16,000	64,000	.011133	.001700	....	....	
16,500	66,000	.012917	.001784	....	....	
17,000	68,000	.014517	.001600	....	....	
17,500	70,000	.016583	.002066	....	....	
18,000	72,000	.018333	.001750	....	....	
18,500	74,000	.020333	.002000	....	....	
19,000	76,000	.022750	.002417	....	....	
19,500	78,000	.025000	.002250	....	....	
20,000	80,000	.027633	.002633	....	....	
20,500	82,000	.0300	.002367	....	....	
21,000	84,000	.0333	.0033	....	....	
21,500	86,000	.0383	.0050	....	....	
22,000	88,000	.0433	.0050	....	....	
22,500	90,000	.0467	.0034	....	....	
23,000	92,000	.0517	.0050	....	....	
23,500	94,000	.0600	.0083	....	....	
24,000	96,000	.0683	.0083	....	....	
24,500	98,000	.0867	.0184	....	....	
24,760	99,040	.1167	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of orignal section	pounds..	99,040
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.1467
Elongation per inch under strain at elastic limit	do....	.001450
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.22 from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		″.22*. ″.24*. ″.11 ″.11. ″.11 ″.09

No. 3195.

Marks, $^{8\,R_1\,A_7}_{T_4\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.		
2, 500	10, 000	.000300	.000167	0.		
3, 750	15, 000	.000450	.000150	0.		
5, 000	20, 000	.000633	.000183	0.		
6, 250	25, 000	.000800	.000167	0.		
7, 500	30, 000	.000983	.000183	0.		
8, 750	35, 000	.001150	.000167	0.		
10, 000	40, 000	.001333	.000183	.000017	.000017	
11, 250	45, 000	.001517	.000184			
11, 500	46, 000	.001567	.000050			
11, 750	47, 000	.001633	.000066			
12, 000	48, 000	.001700	.000067			Elastic limit.
12, 250	49, 000	.001783	.000083			
12, 500	50, 000	.001950	.000167			
12, 750	51, 000	.002117	.000167			
13, 000	52, 000	.002367	.000250			
13, 250	53, 000	.002533	.000166			
13, 500	54, 000	.002867	.000334			
13, 750	55, 000	.003167	.000300			
14, 000	56, 000	.003617	.000450			
14, 250	57, 000	.004050	.000433			
14, 500	58, 000	.004667	.000617			
14, 750	59, 000	.005100	.000433			
15, 000	60, 000	.005733	.000633			
15, 500	62, 000	.007250	.001517			
16, 000	64, 000	.008683	.001433			
16, 500	66, 000	.010100	.001417			
17, 000	68, 000	.011683	.001583			
17, 500	70, 000	.013233	.001550			
18, 000	72, 000	.014900	.001667			
18, 500	74, 000	.016750	.001850			
19, 000	76, 000	.018367	.001617			
19, 500	78, 000	.020333	.001966			
20, 000	80, 000	.022500	.002167			
20, 500	82, 000	.024667	.002167			
21, 000	84, 000	.027250	.002583			
21, 500	86, 000	.029500	.002250			
22, 000	88, 000	.032100	.002600			
22, 500	90, 000	.0350	.0029			
23, 000	92, 000	.0383	.0033			
23, 500	94, 000	.0417	.0034			
24, 000	96, 000	.0483	.0066			
24, 500	98, 000	.0550	.0067			
25, 000	100, 000	.0617	.0067			
25, 500	102, 000	.0733	.0116			
25, 980	103, 920	.1300	.0567			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	103, 920
Elastic limit per square inch of original section	do....	48, 000
Elongation per inch after rupture	inch..	0. 1300
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		3″. 25 from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		″. 07, ″. 09, ″. 23*, ″. 19, ″. 13, ″. 07

NEW HOOP A_7.

No. 3237.

Marks, $^{8}\frac{R_1 A_7}{T_5 M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000433	.000183	0.	....	
5,000	20,000	.000617	.000184	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000967	.000184	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001650	.000183	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001817	.000067	....	....	Elastic limit.
13,750	55,000	.001883	.000066	....	....	
14,000	56,000	.002050	.000167	....	....	
14,250	57,000	.002267	.000217	....	....	
14,500	58,000	.002600	.000333	....	....	
14,750	59,000	.002833	.000233	....	....	
15,000	60,000	.003300	.000467	....	....	
15,500	62,000	.004383	.001083	....	....	
16,000	64,000	.005500	.001117	....	....	
16,500	66,000	.006750	.001250	....	....	
17,000	68,000	.008083	.001333	....	....	
17,500	70,000	.009500	.001417	....	....	
18,000	72,000	.010917	.001417	....	....	
18,500	74,000	.012467	.001550	....	....	
19,000	76,000	.014000	.001533	....	....	
19,500	78,000	.015500	.001500	....	....	
20,000	80,000	.017383	.001883	....	....	
20,500	82,000	.019500	.002117	....	....	
21,000	84,000	.021167	.001667	....	....	
21,500	86,000	.023083	.001816	....	....	
22,000	88,000	.025000	.001917	....	....	
22,500	90,000	.027250	.002250	....	....	
23,000	92,000	.029500	.002250	....	....	
23,500	94,000	.032500	.003000	....	....	
24,000	96,000	.035083	.002583	....	....	
24,500	98,000	.0383	.003217	....	....	
25,000	100,000	.0433	.0050	....	....	
25,500	102,000	.0483	.0050	....	....	
26,000	104,000	.0533	.0050	....	....	
26,500	106,000	.0617	.0084	....	....	
27,000	108,000	.0733	.0116	....	....	
27,480	109,920	.1033	.0300	....	....	Tensile strength.

General summary.

Specific gravity	7.8505
Hardness	22.77
Tensile strength per square inch of original section ....pounds..	109,920
Elastic limit per square inch of original section ....do ...	54,000
Elongation per inch after rupture ....inch..	0.1383
Elongation per inch under strain at elastic limit ....do ...	.001817
Reduction in diameter at point of rupture ....do....	.094
Reduction in area after rupture, per centum of original section	30.6
Position of rupture	2″.25 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.08, ″.10, ″.12, ″.18, ″.24*, ″.11

No. 3238.

Marks, $^{8\,R_1\,A_7}_{\;T_6\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	—.000017	—.000017	
2,500	10,000	.000283	.000166	—.000017	0.	
3,750	15,000	.000450	.000167	—.000017	0.	
5,000	20,000	.000617	.000167	—.000017	0.	
6,250	25,000	.000783	.000166	—.000017	0.	
7,500	30,000	.000950	.000167	—.000017	0.	
8,750	35,000	.001117	.000167	—.000017	0.	
10,000	40,000	.001283	.000166	—.000017	0.	
11,250	45,000	.001450	.000167	....	....	
12,500	50,000	.001633	.000183	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001750	.000050	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001817	.000034	....	....	Elastic limit.
14,000	56,000	.001900	.000083	....	....	
14,250	57,000	.002000	.000100	....	....	
14,500	58,000	.002083	.000083	....	....	
14,750	59,000	.002250	.000167	....	....	
15,000	60,000	.002583	.000333	....	....	
15,500	62,000	.003167	.000584	....	....	
16,000	64,000	.004083	.000916	....	....	
16,500	66,000	.005250	.001167	....	....	
17,000	68,000	.006583	.001333	....	....	
17,500	70,000	.007967	.001384	....	....	
18,000	72,000	.009500	.001533	....	....	
18,500	74,000	.010917	.001417	....	....	
19,000	76,000	.012417	.001500	....	....	
19,500	78,000	.014000	.001583	....	....	
20,000	80,000	.015667	.001667	....	....	
20,500	82,000	.017500	.001833	....	....	
21,000	84,000	.019167	.001667	....	....	
21,500	86,000	.020950	.001783	....	....	
22,000	88,000	.023000	.002050	....	....	
22,500	90,000	.025167	.002167	....	....	
23,000	92,000	.027500	.002333	....	....	
23,500	94,000	.030000	.002500	....	....	
24,000	96,000	.032333	.002333	....	....	
24,500	98,000	.0367	.004367	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0450	.0050	....	....	
26,000	104,000	.0500	.0050	....	....	
26,500	106,000	.0550	.0050	....	....	
27,000	108,000	.0633	.0083	....	....	
27,810	111,240	.1033	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,240
Elastic limit per square inch of original section	do ...	55,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.001817
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		3″ from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.09, ″.14, ″.27*, ″.13, ″.10, ″.09

No. 3239.

Marks, $^{8\,R_1\,A_7}_{T_7\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001017	.000184	0.	....	
8,750	35,000	.001200	.000183	0.	....	
10,000	40,000	.001350	.000150	0.	....	
11,250	45,000	.001533	.000183	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001750	.000050	....	....	
13,000	52,000	.001783	.000033	....	....	
13,250	53,000	.001817	.000034	....	....	Elastic limit.
13,500	54,000	.001900	.000083	....	....	
13,750	55,000	.001967	.000067	....	....	
14,000	56,000	.002033	.000066	....	....	
14,250	57,000	.002183	.000150	....	....	
14,500	58,000	.002617	.000434	....	....	
14,750	59,000	.002833	.000216	....	....	
15,000	60,000	.003217	.000384	....	....	
15,500	62,000	.004250	.001033	....	....	
16,000	64,000	.005283	.001033	....	....	
16,500	66,000	.006417	.001134	....	....	
17,000	68,000	.007750	.001333	....	....	
17,500	70,000	.009167	.001417	....	....	
18,000	72,000	.010500	.001333	....	....	
18,500	74,000	.011950	.001450	....	....	
19,000	76,000	.013533	.001583	....	....	
19,500	78,000	.015083	.001550	....	....	
20,000	80,000	.016667	.001584	....	....	
20,500	82,000	.018450	.001783	....	....	
21,000	84,000	.020017	.001567	....	....	
21,500	86,000	.022167	.002150	....	....	
22,000	88,000	.024167	.002000	....	....	
22,500	90,000	.026417	.002250	....	....	
23,000	92,000	.028750	.002333	....	....	
23,500	94,000	.031333	.002583	....	....	
24,000	96,000	.034250	.002917	....	....	
24,500	98,000	.037500	.003250	....	....	
25,000	100,000	.0417	.0042	....	....	
25,500	102,000	.0467	.0050	....	....	
26,000	104,000	.0533	.0066	....	....	
26,500	106,000	.0600	.0067	....	....	
27,000	108,000	.0683	.0083	....	....	
27,500	110,000	.0850	.0167	....	....	
27,650	110,600	.1033	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	110,600
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1300
Elongation per inch under strain at elastic limit	do....	.001817
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		2″.80 from neck
Character of broken surface		silky, 50 per cent.; granular, 50 per cent.
Elongation of inch sections		″.09, ″.14, ″.27*, ″.10, ″.09, ″.09

No. 3240.

Marks, $^{8}\substack{R_1\ A_7 \\ T_8\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001333	.000183	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001750	.000050	....	....	
13,250	53,000	.001783	.000033	....	....	
13,500	54,000	.001817	.000034	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	
14,250	57,000	.001933	.000050	....	....	
14,500	58,000	.001983	.000050	....	....	
14,750	59,000	.002033	.000050	....	....	Elastic limit.
15,000	60,000	.002117	.000084	....	....	
15,250	61,000	.002183	.000066	....	....	
15,500	62,000	.002300	.000117	....	....	
15,750	63,000	.002433	.000133	....	....	
16,000	64,000	.002667	.000234	....	....	
16,500	66 000	.003333	.000666	....	....	
17,000	68,000	.004250	.000917	....	....	
17,500	70,000	.005500	.001250	....	....	
18,000	72,000	.006667	.001167	....	....	
18,500	74,000	.008417	.001750	....	....	
19,000	76,000	.010000	.001583	....	....	
19,500	78,000	.011500	.001500	....	....	
20,000	80,000	.012917	.001417	....	....	
20,500	82,000	.014500	.001583	....	....	
21,000	84,000	.016083	.001583	....	....	
21,500	86,000	.017917	.001834	....	....	
22,000	88,000	.019833	.001916	....	....	
22,500	90,0 0	.021667	.001834	....	....	
23,000	92,000	.023667	.002000	....	....	
23,500	94,000	.025667	.002000	....	....	
24,000	96,000	.027917	.002250	....	....	
24,500	98,000	.030417	.002500	....	....	
25,000	100,000	.033250	.002833	....	....	
25,500	102,000	.036333	.003083	....	....	
26,000	104,000	.0417	.005367	....	....	
26,500	106,000	.0450	.0033	....	....	
27,000	108,000	.0500	.0050	....	....	
27,500	110,000	.0550	.0050	....	....	
28,000	112,000	.0650	.0100	....	....	
28,440	113,760	.0867	.0217	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............pounds.. 113,760
Elastic limit per square inch of original section..............do ... 59,000
Elongation per inch after rupture..............inch.. 0.0983
Elongation per inch under strain at elastic limit..............do .... .002033
Reduction in diameter at point of rupture..............do .... .084
Reduction in area after rupture, per centum of original section.............. 27.6
Position of rupture.............. ".55 from neck
Character of broken surface.............. granular; silky center
Elongation of inch sections.............. ".07, ".07, ".07, ".07, ".08, ".23*

HOOP C_1.

No. 3052.

Marks, $^{8\ B_1\ C_1}_{B\ T_1\ 1}$
Diameter, ″.564.
Sectional area, .25 square inch.

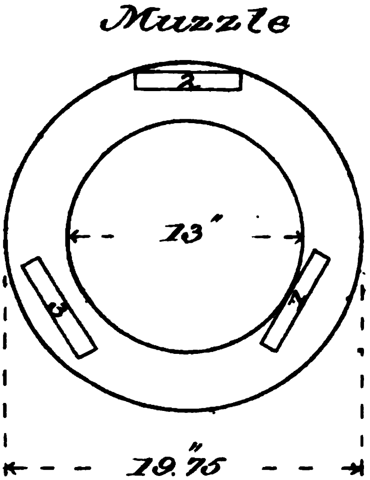
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	....	....	
10,000	40,000	.001267	.000167	....	....	
11,250	45,000	.001400	.000133	....	....	
12,500	50,000	.001600	.000200	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001700	.000067	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001833	.000033	....	....	
14,250	57,000	.001867	.000034	....	....	
14,500	58,000	.001933	.000066	....	....	
14,750	59,000	.001967	.000034	....	....	
15,000	60,000	.002033	.000066	....	....	
15,250	61,000	.002067	.000034	....	....	Elastic limit.
15,500	62,000	.002733	.000066	....	....	
15,750	63,000	.003667	.000934	....	....	
16,000	64,000	.005167	.001500	....	....	
16,500	66,000	.006667	.001500	....	....	
17,000	68,000	.007900	.001233	....	....	
17,500	70,000	.009133	.001233	....	....	
18,000	72,000	.010500	.001367	....	....	
18,500	74,000	.011900	.001400	....	....	
19,000	76,000	.013400	.001500	....	....	
19,500	78,000	.015000	.001600	....	....	
20,000	80,000	.016600	.001600	....	....	
20,500	82,000	.018333	.001733	....	....	
21,000	84,000	.019933	.001600	....	....	
21,500	86,000	.021733	.001800	....	....	
22,000	88,000	.023733	.002000	....	....	
22,500	90,000	.025667	.001934	....	....	
23,000	92,000	.027800	.002133	....	....	
23,500	94,000	.030333	.002533	....	....	
24,000	96,000	.033167	.002834	....	....	
24,500	98,000	.036000	.002833	....	....	
25,000	100,000	.039400	.003400	....	....	
25,500	102,000	.043033	.003633	....	....	
26,000	104,000	.0467	.003667	....	....	
26,500	106,000	.0533	.0066	....	....	
27,000	108,000	.0600	.0067	....	....	
27,500	110,000	.0700	.0100	....	....	
28,000	112,000	.0967	.0267	....	....	
28,080	112,320	.1133	.0166	....	....	Tensile strength.

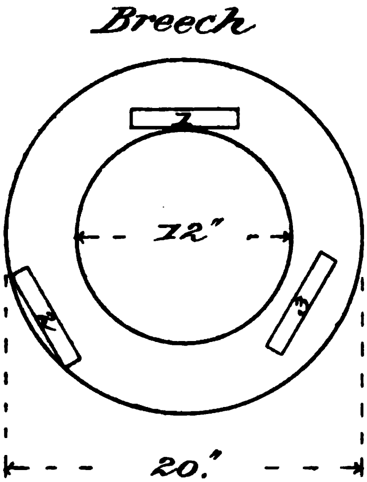
General summary.

Tensile strength per square inch of original section	pounds..	112,320
Elastic limit per square inch of original section	do ...	61,000
Elongation per inch after rupture	inch..	0.1633
Elongation per inch under strain at elastic limit	do....	.002067
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.75 from neck
Character of broken surface		granular; silky eccentric spot
Elongation of inch sections		″.10, ″.13, ″.[illegible]

8 inch steel B. L. Rifle

Hoop C 1





H Ex No 16 50, 1.

No. 3053.

Marks, $^{8\,R,\,C}_{B\,T,\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001233	.000166	....	....	
11,250	45,000	.001433	.000200	....	....	
12,500	50,000	.001600	.000167	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001700	.000067	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001833	.000066	....	....	
14,000	56,000	.001900	.000067	....	....	
14,250	57,000	.001933	.000033	....	....	
14,500	58,000	.001967	.000034	....	....	
14,750	59,000	.002033	.000066	....	....	Elastic limit.
15,000	60,000	.002167	.000134	....	....	
15,250	61,000	.003200	.001033	....	....	
15,500	62,000	.004400	.001200	....	....	
16,000	64,000	.005800	.001400	....	....	
16,500	66,000	.006933	.001133	....	....	
17,000	68,000	.008267	.001334	....	....	
17,500	70,000	.009600	.001333	....	....	
18,000	72,000	.010933	.001333	....	....	
18,500	74,000	.012233	.001300	....	....	
19,000	76,000	.013733	.001500	....	....	
19,500	78,000	.015233	.001500	....	....	
20,000	80,000	.016700	.001467	....	....	
20,500	82,000	.018367	.001667	....	....	
21,000	84,000	.020067	.001700	....	....	
21,500	86,000	.021867	.001800	....	....	
22,000	88,000	.023800	.001933	....	....	
22,500	90,000	.025733	.001933	....	....	
23,000	92,000	.028100	.002367	....	....	
23,500	94,000	.030667	.002567	....	....	
24,000	96,000	.033033	.002366	....	....	
24,500	98,000	.035933	.002900	....	....	
25,000	100,000	.039500	.003567	....	....	
25,500	102,000	.0433	.0038	....	....	
26,000	104,000	.0467	.0034	....	....	
26,500	106,000	.0533	.0066	....	....	
27,000	108,000	.0600	.0067	....	....	
27,500	110,000	.0700	.0100	....	....	
27,980	111,920	.1100	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 111,920
Elastic limit per square inch of original section....................do.... 59,000
Elongation per inch after rupture....................inch.. 0.1667
Elongation per inch under strain at elastic limit....................do.... .002033
Reduction in diameter at point of rupture....................do.... .114
Reduction in area after rupture, per centum of original section.................... 36.4
Position of rupture....................1″.20 from neck
Character of broken surface..........granular; silky spot at circumference. Opened cracks in stem
Elongation of inch sections....................″.20*, ″.20*, ″.10

No. 3054.

Marks, $^{8\,R_1\,C_1}_{B\,T_2\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000400	.000100	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	....	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001667	.000200	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001833	.000066	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001933	.000066	....	....	
14,250	57,000	.001967	.000034	....	....	Elastic limit.
14,500	58,000	.003167	.001200	....	....	
14,750	59,000	.004333	.001166	....	....	
15,000	60,000	.005167	.000834	....	....	
15,500	62,000	.006400	.001233	....	....	
16,000	64,000	.007667	.001267	....	....	
16,500	66,000	.008900	.001233	....	....	
17,000	68,000	.010233	.001333	....	....	
17,500	70,000	.011600	.001367	....	....	
18,000	72,000	.013067	.001467	....	....	
18,500	74,000	.014433	.001366	....	....	
19,000	76,000	.016000	.001567	....	....	
19,500	78,000	.017667	.001667	....	....	
20,000	80,000	.019500	.001833	....	....	
20,500	82,000	.021200	.001700	....	....	
21,000	84,000	.022867	.001667	....	....	
21,500	86,000	.025100	.002233	....	....	
22,000	88,000	.027167	.002067	....	....	
22,500	90,000	.029667	.002500	....	....	
23,000	92,000	.032067	.002400	....	....	
23,500	94,000	.034833	.002766	....	....	
24,000	96,000	.038333	.003500	....	....	
24,500	98,000	.041633	.003300	....	....	
25,000	100,000	.0467	.005067	....	....	
25,500	102,000	.0533	.0066	....	....	
26,000	104,000	.0600	.0067	....	....	
26,500	106,000	.0667	.0067	....	....	
27,000	108,000	.0833	.0166	....	....	
27,220	108,880	.1100	.0267	....	....	Tensile strength.

General summary.

Specific gravity	7.8525
Hardness	22.26
Tensile strength per square inch of original section .... pounds..	108,880
Elastic limit per square inch of original section .... do ...	57,000
Elongation per inch after rupture .... inch..	0.1733
Elongation per inch under strain at elastic limit .... do....	.001967
Reduction in diameter at point of rupture .... do ...	.094
Reduction in area after rupture, per centum of original section	30.6
Position of rupture	at middle of stem
Character of broken surface	silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections	".11, ".28*, ".13

No. 3055.

Marks, $^{8\ R\ C}_{M\ T\ 1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.001000	.000200	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	....	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001733	.000066	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001833	.000033	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001933	.000066	....	....	
14,250	57,000	.001967	.000034	....	....	
14,500	58,000	.002000	.000033	....	....	
14,750	59,000	.002033	.000038	....	....	
15,000	60,000	.002100	.000067	....	....	Elastic limit.
15,250	61,000	.002667	.000367	....	....	
15,500	62,000	.003500	.000833	....	....	
16,000	64,000	.006667	.003167	....	....	
16,500	66,000	.008333	.001666	....	....	
17,000	68,000	.010000	.001667	....	....	
17,500	70,000	.011267	.001267	....	....	
18,000	72,000	.012167	.000900	....	....	
18,500	74,000	.013667	.001500	....	....	
19,000	76,000	.015233	.001566	....	....	
19,500	78,000	.016867	.001634	....	....	
20,000	80,000	.018500	.001633	....	....	
20,500	82,000	.020367	.001867	....	....	
21,000	84,000	.022267	.001900	....	....	
21,500	86,000	.024467	.002200	....	....	
22,000	88,000	.026333	.001866	....	....	
22,500	90,000	.028400	.002067	....	....	
23,000	92,000	.031000	.002600	....	....	
23,500	94,000	.033667	.002667	....	....	
24,000	96,000	.037000	.003333	....	....	
24,500	98,000	.040267	.003267	....	....	
25,000	100,000	.044500	.004233	....	....	
25,500	102,000	.0500	.0055	....	....	
26,000	104,000	.0567	.0067	....	....	
26,500	106,000	.0633	.0066	....	....	
27,000	108,000	.0733	.0100	....	....	
27,500	110,000	.1033	.0300	....	....	
27,520	110,080	.1200	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 110,080
Elastic limit per square inch of original section..............................do ... 60,000
Elongation per inch after rupture..............................inch.. 0.1733
Elongation per inch under strain at elastic limit..............................do ... .002100
Reduction in diameter at point of rupture..............................do.... .134
Reduction in area after rupture, per centum of original section.............................. 41.9
Position of rupture..............................″.50 from neck
Character of broken surface..............................silky; slightly granular at circumference
Elongation of inch sections..............................″.10, ″.12, ″.30*

No. 3056.

Marks, $\substack{3\ R_1\ C_1 \\ M\ T_3\ O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001133	.000200	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001500	.000200	....	....	
12, 500	50, 000	.001667	.000167	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001767	.000067	....	....	
13, 250	53, 000	.001867	.000100	....	....	
13, 500	54, 000	.001933	.000066	....	....	
13, 750	55, 000	.001967	.000034	....	....	
14, 000	56, 000	.002000	.000033	....	....	Elastic limit.
14, 250	57, 000	.006333	.004333	....	....	
14, 500	58, 000	.007000	.000667	....	....	
14, 750	59, 000	.007433	.000433	....	....	
15, 000	60, 000	.008133	.000700	....	....	
15, 500	62, 000	.009500	.001367	....	....	
16, 000	64, 000	.011000	.001500	....	....	
16, 500	66, 000	.012333	.001333	....	....	
17, 000	68, 000	.013767	.001434	....	....	
17, 500	70, 000	.015433	.001666	....	....	
18, 000	72, 000	.017000	.001567	....	....	
18, 500	74, 000	.018833	.001833	....	....	
19, 000	76, 000	.020500	.001667	....	....	
19, 500	78, 000	.022500	.002000	....	....	
20, 000	80, 000	.024667	.002167	....	....	
20, 500	82, 000	.026533	.001866	....	....	
21, 000	84, 000	.028900	.002367	....	....	
21, 500	86, 000	.031333	.002433	....	....	
22, 000	88, 000	.034333	.003000	....	....	
22, 500	90, 000	.037833	.003500	....	....	
23, 000	92, 000	.041000	.003167	....	....	
23, 500	94, 000	.0433	.0023	....	....	
24, 000	96, 000	.0467	.0034	....	....	
24, 500	98, 000	.0567	.0100	....	....	
25, 000	100, 000	.0633	.0066	....	....	
25, 500	102, 000	.0767	.0134	....	....	
26, 000	104, 000	.1033	.0266	....	....	
26, 070	104, 280	.1233	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104, 280
Elastic limit per square inch of original section	do....	56, 000
Elongation per inch after rupture	inch..	0. 1233
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		1".22 from neck
Character of broken surface		silky
Elongation of inch sections		".22*, ".25*, ".11

No. 3057.

Marks, $\frac{S\ R,\ C,}{M\ T,\ M}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000533	.000233	0.	....	
5,000	20,000	.000700	.000167	.000033	.000033	
6,250	25,000	.000867	.000167	.000033	0.	
7,500	30,000	.001033	.000166	.000033	0.	
8,750	35,000	.001233	.000200	....	....	
10,000	40,000	.001400	.000167	....	....	
11,250	45,000	.001567	.000167	....	....	
12,500	50,000	.001733	.000066	....	....	
12,750	51,000	.001767	.000034	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001867	.000067	....	....	
13,500	54,000	.001967	.000100	....	....	
13,750	55,000	.002033	.000066	....	....	
14,000	56,000	.002100	.000067	....	....	Elastic limit.
14,250	57,000	.003233	.001133	....	....	
14,500	58,000	.005500	.002267	....	....	
14,750	59,000	.005900	.000400	....	....	
15,000	60,000	.006600	.000700	....	....	
15,500	62,000	.008000	.001400	....	....	
16,000	64,000	.009367	.001367	....	....	
16,500	66,000	.010600	.001233	....	....	
17,000	68,000	.012000	.001400	....	....	
17.500	70,000	.013367	.001367	....	....	
18,000	72,000	.015000	.001633	....	....	
18,500	74,000	.016667	.001667	....	....	
19,000	76,000	.018167	.001500	....	....	
19,500	78,000	.020233	.002066	....	....	
20,000	80,000	.022167	.001934	....	....	
20,500	82,000	.023833	.001666	....	....	
21,000	84,000	.025667	.001834	....	....	
21,500	86,000	.028167	.002500	....	....	
22,000	88,000	.030500	.002333	....	....	
22,500	90,000	.033100	.002600	....	....	
23,000	92,000	.036167	.003067	....	....	
23,500	94,000	.039333	.003166	....	....	
24,000	96,000	.0433	.003967	....	....	
24,500	98,000	.0467	.0034	....	....	
25,000	100,000	.0533	.0066	....	....	
25,500	102,000	.0600	.0067	....	....	
26,000	104,000	.0700	.0100	....	....	
26,500	106,000	.0867	.0167	....	....	
26,740	106,960	.1267	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	106,960
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch..	0.1833
Elongation per inch under strain at elastic limit	do....	.002100
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1''.40 from neck
Character of broken surface		silky; slightly granular
Elongation of inch sections		''.11, ''.27* ''.17

HOOP C_3.

No. 2913.

Marks, $^{8}\substack{E_1\ C_3 \\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

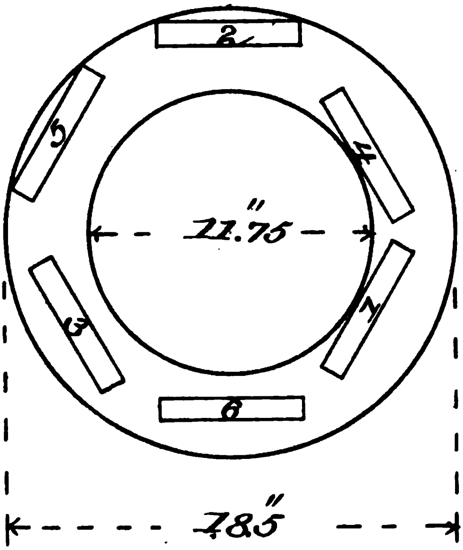
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001900	.000067	....	....	
14,250	57,000	.001900	0.	....	....	
14,500	58,000	.001933	.000033	....	....	
14,750	59,000	.001967	.000034	....	....	
15,000	60,000	.002000	.000033	....	....	
15,250	61,000	.002033	.000033	....	....	Elastic limit.
15,500	62,000	.002200	.000167	....	....	
15,750	63,000	.003733	.001533	....	....	
16,000	64,000	.005200	.001467	....	....	
16,500	66,000	.007367	.002167	....	....	
17,000	68,000	.009167	.001800	....	....	
17,500	70,000	.010833	.001666	....	....	
18,000	72,000	.012500	.001667	....	....	
18,500	74,000	.014233	.001733	....	....	
19,000	76,000	.016133	.001900	....	....	
19,500	78,000	.018000	.001867	....	....	
20,000	80,000	.020400	.002400	....	....	
20,500	82,000	.022467	.002067	....	....	
21,000	84,000	.024667	.002200	....	....	
21,500	86,000	.027233	.002566	....	....	
22,000	88,000	.030000	.002767	....	....	
22,500	90,000	.033000	.003000	....	....	
23,000	92,000	.036667	.003667	....	....	
23,500	94,000	.041000	.004333	....	....	
24,000	96,000	.045833	.004833	....	....	
24,500	98,000	.052167	.006334	....	....	
25,000	100,000	.060000	.007833	....	....	
25,500	102,000	.0783	.0183	....	....	
26,000	104,000	.1000	.0267	....	....	
26,060	104,240	.1167	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.................................. pounds.. 104,240
Elastic limit per square inch of original section .... do.... 61,000
Elongation per inch after rupture..inch.. 0.2000
Elongation per inch under strain at elastic limit...do.... .002033
Reduction in diameter at point of rupture ....do.... .164
Reduction in area after rupture, per centum of original section 49.7
Position of rupture...at middle of stem
Character of broken surface ....silky
Elongation of inch sections ....″.10, ″.37*, ″.13

8 inch steel B.L. Rifle

Hoop C2



H Ex No 16 50, 1.

No. 2914.

Marks, $^{8}\,{}^{B_1}_{T_2}\,{}^{C_3}_{O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.000933	.000133	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001600	.000167	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001767	.000067	....	....	
13,750	55,000	.001833	.000066	....	....	Elastic limit.
14,000	56,000	.001933	.000100	....	....	
14,250	57,000	.002033	.000100	....	....	
14,500	58,000	.002933	.000900	....	....	
14,750	59,000	.003733	.000800	....	....	
15,000	60,000	.005000	.001267	....	....	
15,500	62,000	.007000	.002000	....	....	
16,000	64,000	.008767	.001767	....	....	
16,500	66,000	.010333	.001566	....	....	
17,000	68,000	.012000	.001667	....	....	
17,500	70,000	.013500	.001500	....	....	
18,000	72,000	.015167	.001667	....	....	
18,500	74,000	.016833	.001666	....	....	
19,000	76,000	.019000	.002167	....	....	
19,500	78,000	.021500	.002500	....	....	
20,000	80,000	.023500	.002000	....	....	
20,500	82,000	.025833	.002333	....	....	
21,000	84,000	.028000	.002167	....	....	
21,500	86,000	.031033	.003033	....	....	
22,000	88,000	.034333	.003300	....	....	
22,500	90,000	.037667	.003334	....	....	
23,000	92,000	.042333	.004666	....	....	
23,500	94,000	.048000	.005667	....	....	
24,000	96,000	.053667	.005667	....	....	
24,500	98,000	.062000	.008333	....	....	
25,000	100,000	.0700	.0080	....	....	
25,500	102,000	.0967	.0267	....	....	
25,590	102,360	.1233	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102,360
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1967
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.13, ″.34*, ″.12

No. 2915.

Marks, $\genfrac{}{}{0pt}{}{8\ \text{R. C.}}{\text{T. M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000700	.000200	.000033	.000033	
6,250	25,000	.000867	.000167	.000033	0.	
7,500	30,000	.001067	.000200	.000033	0.	
8,750	35,000	.001200	.000133	.000033	0.	
10,000	40,000	.001400	.000200	.000067	.000034	
11,250	45,000	.001600	.000200	....	....	
12,500	50,000	.001767	.000167	....	....	
12,750	51,000	.001800	.000033	....	....	
13,000	52,000	.001867	.000067	....	....	
13,250	53,000	.001900	.000033	....	....	
13,500	54,000	.001967	.000067	....	....	
13,750	55,000	.002000	.000033	....	....	Elastic limit.
14,000	56,000	.002100	.000100	....	....	
14,250	57,000	.002200	.000100	....	....	
14,500	58,000	.003000	.000800	....	....	
14,750	59,000	.004833	.001833	....	....	
15,000	60,000	.005667	.001334	....	....	
15,500	62,000	.007333	.001666	....	....	
16,000	64,000	.009167	.001834	....	....	
16,500	66,000	.011000	.001833	....	....	
17,000	68,000	.012667	.001667	....	....	
17,500	70,000	.014167	.001500	....	....	
18,000	72,000	.015733	.001566	....	....	
18,500	74,000	.017333	.001600	....	....	
19,000	76,000	.019333	.002000	....	....	
19,500	78,000	.021500	.002167	....	....	
20,000	80,000	.023733	.002233	....	....	
20,500	82,000	.025833	.002100	....	....	
21,000	84,000	.028667	.002834	....	....	
21,500	86,000	.031667	.003000	....	....	
22,000	88,000	.035000	.003333	....	....	
22,500	90,000	.038000	.003000	....	....	
23,000	92,000	.042500	.004500	....	....	
23,500	94,000	.047333	.004833	....	....	
24,000	96,000	.053667	.006334	....	....	
24,500	98,000	.062000	.008333	....	....	
25,000	100,000	.0733	.0113	....	....	
25,500	102,000	.1100	.0367	....	....	Tensile strength.

General summary.

Specific gravity	7.8484
Hardness	21.76
Tensile strength per square inch of original section ....pounds..	102,000
Elastic limit per square inch of original section ....do....	55,000
Elongation per inch after rupture ....inch..	0.1133
Elongation per inch under strain at elastic limit ....do....	.002000
Reduction in diameter at point of rupture ....do....	.044
Reduction in area after rupture, per centum of original section	15.0
Position of rupture	1″.30 from neck
Character of broken surface	granular, radiating from a flaky spot at the circumference
Elongation of inch sections	″.10, ″.13*, ″.11

No. 2940.

Marks, $^{8}\frac{R_1 C_4}{T_4 I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000500	.000200	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001933	.000066	....	....	
14,500	58,000	.001967	.000034	....	....	
14,750	59,000	.002000	.000033	....	....	
15,000	60,000	.002067	.000067	....	....	Elastic limit.
15,250	61,000	.002567	.000500	....	....	
15,500	62,000	.003667	.001100	....	....	
15,750	63,000	.005000	.001333	....	....	
16,000	64,000	.006233	.001233	....	....	
16,500	66,000	.008167	.001934	....	....	
17,000	68,000	.009933	.001766	....	....	
17,500	70,000	.011567	.001634	....	....	
18,000	72,000	.013333	.001766	....	....	
18,500	74,000	.015167	.001834	....	....	
19,000	76,000	.017000	.001833	....	....	
19,500	78,000	.019000	.002000	....	....	
20,000	80,000	.021000	.002000	....	....	
20,500	82,000	.023333	.002333	....	....	
21,000	84,000	.025833	.002500	....	....	
21,500	86,000	.028033	.002200	....	....	
22,000	88,000	.030933	.002900	....	....	
22,500	90,000	.033833	.002900	....	....	
23,000	92,000	.037733	.003900	....	....	
23,500	94,000	.042133	.004400	....	....	
24,000	96,000	.0450	.002867	....	....	
24,500	98,000	.0533	.0083	....	....	
25,000	100,000	.0633	.0100	....	....	
25,500	102,000	.0733	.0100	....	....	
25,980	103,920	.1133	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	103,920
Elastic limit per square inch of original section	do	60,000
Elongation per inch after rupture	inch	0.1933
Elongation per inch under strain at elastic limit	do	.002067
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.10 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.10, ″.17, ″.31*

No. 2941.

Marks, $^{8\,R_1\,C_2}_{\;T_8\,O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10.000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001500	.000200	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	Elastic limit.
14,250	57,000	.001967	.000100	....	....	
14,500	58,000	.002300	.000333	....	....	
14,750	59,000	.003000	.000700	....	....	
15,000	60,000	.004867	.001867	....	....	
15,500	62,000	.007000	.002133	....	....	
16,000	64,000	.008400	.001400	....	....	
16,500	66,000	.010100	.001700	....	....	
17,000	68,000	.011733	.001633	....	....	
17,500	70,000	.013367	.001634	....	....	
18,000	72,000	.015267	.001900	....	....	
18,500	74,000	.017167	.001900	....	....	
19,000	76,000	.019200	.002033	....	....	
19,500	78,000	.021233	.002033	....	....	
20,000	80,000	.023333	.002100	....	....	
20,500	82,000	.025800	.002467	....	....	
21,000	84,000	.028433	.002633	....	....	
21,500	86,000	.031267	.002834	....	....	
22,000	88,000	.034600	.003333	....	....	
22,500	90,000	.038167	.003567	....	....	
23,000	92,000	.042433	.004266	....	....	
23,500	94,000	.0467	.004267	....	....	
24,000	96,000	.0533	.0066	....	....	
24,500	98,000	.0633	.0100	....	....	
25,000	100,000	.0733	.0100	....	....	
25,380	101,520	.1067	.0334	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	101,520
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.1867
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1″.25 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.09, ″.16, ″.31

No. 2942.

Marks, $\genfrac{}{}{0pt}{}{^{8}R_{1}C_{3}}{T_{6}M}$
Diameter, ″564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001367	.000200	.000033	.000033	
11,250	45,000	.001533	.000166	....	....	
12,500	50,000	.001733	.000200	....	....	
12,750	51,000	.001800	.000067	....	....	
13,000	52,000	.001833	.000033	....	....	Elastic limit.
13,250	53,000	.001967	.000134	....	....	
13,500	54,000	.003333	.001366	....	....	
13,750	55,000	.004333	.001000	....	....	
14,000	56,000	.005267	.000934	....	....	
14,250	57,000	.006200	.000933	....	....	
14,500	58,000	.007000	.000800	....	....	
14,750	59,000	.007700	.000700	....	....	
15,000	60,000	.008700	.001000	....	....	
15,500	62,000	.010167	.001467	....	....	
16,000	64,000	.011800	.001633	....	....	
16,500	66,000	.013433	.001633	....	....	
17,000	68,000	.015033	.001600	....	....	
17,500	70,000	.016833	.001800	....	....	
18,000	72,000	.018667	.001834	....	....	
18,500	74,000	.020667	.002000	....	....	
19,000	76,000	.022667	.002000	....	....	
19,500	78,000	.025033	.002366	....	....	
20,000	80,000	.027433	.002400	....	....	
20,500	82,000	.030000	.002567	....	....	
21,000	84,000	.032833	.002833	....	....	
21,500	86,000	.036200	.003367	....	....	
22,000	88,000	.040167	.003967	....	....	
22,500	90,000	.044667	.004500	....	....	
23,000	92,000	.0500	.005333	....	....	
23,500	94,000	.0567	.0067	....	....	
24,000	96,000	.0633	.0066	....	....	
24,500	98,000	.0767	.0134	....	....	
24,950	99,800	.1233	.0466	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 99,800
Elastic limit per square inch of original section ....do.... 52,000
Elongation per inch after rupture ....inch.. 0.1833
Elongation per inch under strain at elastic limit.......................................do.... .001833
Reduction in diameter at point of rupture ....do.... .164
Reduction in area after rupture, per centum of original section.................................. 49.7
Position of rupture..″.95 from neck
Character of broken surface...silky
Elongation of inch sections..″.10, ″.14, ″.31*

HOOP C$_3$.

No. 2994.

Marks, $\begin{smallmatrix}8\,R_1\,C_3\\ B\;T\;\;I\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

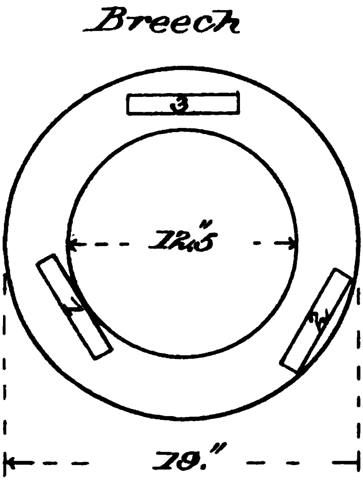
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001800	.000067	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001933	.000033	....	....	
14,750	59,000	.001967	.000034	....	....	Elastic limit.
15,000	60,000	.002867	.000900	....	....	
15,250	61,000	.004233	.001366	....	....	
15,500	62,000	.007000	.002767	....	....	
16,000	64,000	.008167	.001167	....	....	
16,500	66,000	.009733	.001566	....	....	
17,000	68,000	.011333	.001600	....	....	
17,500	70,000	.012533	.001200	....	....	
18,000	72,000	.013900	.001367	....	....	
18,500	74,000	.015500	.001600	....	....	
19,000	76,000	.017067	.001567	....	....	
19,500	78,000	.018733	.001666	....	....	
20,000	80,000	.020467	.001734	....	....	
20,500	82,000	.022800	.002333	....	....	
21,000	84,000	.024367	.001567	....	....	
21,500	86,000	.026667	.002300	....	....	
22,000	88,000	.028833	.002166	....	....	
22,500	90,000	.031500	.002667	....	....	
23,000	92,000	.034100	.002600	....	....	
23,500	94,000	.037433	.003333	....	....	
24,000	96,000	.041000	.003567	....	....	
24,500	98,000	.045333	.004333	....	....	
25,000	100,000	.049667	.004334	....	....	
25,500	102,000	.0567	.007033	....	....	
26,000	104,000	.0667	.0100	....	....	
26,500	106,000	.0767	.0100	....	....	
27,000	108,000	.1000	.0233	....	....	
27,060	108,240	.1200	.0200	....	....	Tensile strength.

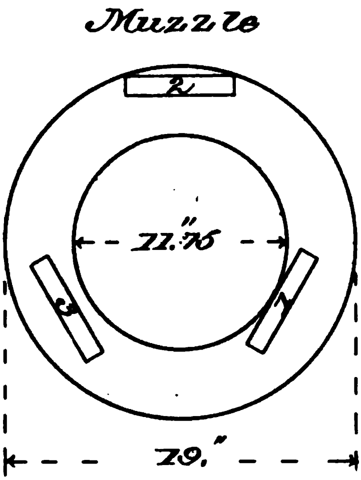
General summary.

Tensile strength per square inch of original section	pounds..	108,240
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.35 from neck
Character of broken surface		silky
Elongation of inch sections		″.10, ″.27*, ″.17

8 inch Steel B. L. Rifle

Hoop C3


Breech


Muzzle

No. 2995.

Marks, $^{6R,\,C_2}_{BT,\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001833	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001933	.000100	....	....	
14,250	57,000	.001967	.000034	....	....	
14,500	58,000	.002033	.000066	....	....	Elastic limit.
14,750	59,000	.003233	.001200	....	....	
15,000	60,000	.005500	.002267	....	....	
15,500	62,000	.007233	.001733	....	....	
16,000	64,000	.008333	.001100	....	....	
16,500	66,000	.009733	.001400	....	....	
17,000	68,000	.011100	.001367	....	....	
17,500	70,000	.012667	.001567	....	....	
18,000	72,000	.014033	.001366	....	....	
18,500	74,000	.015800	.001767	....	....	
19,000	76,000	.017433	.001633	....	....	
19,500	78,000	.019333	.001900	....	....	
20,000	80,000	.021033	.001700	....	....	
20,500	82,000	.023067	.002034	....	....	
21,000	84,000	.025000	.001933	....	....	
21,500	86,900	.027500	.002500	....	....	
22,000	88,000	.029800	.002300	....	....	
22,500	90,000	·032500	.002700	....	....	
23,000	92,000	.035833	.003338	....	....	
23,500	94,000	.039333	.003500	....	....	
24,000	96,000	.042833	.003500	....	....	
24,500	98,000	.047667	.004834	....	....	
25,000	100,000	.052833	.005166	....	....	
25,500	102,000	.0600	.007167	....	....	
26,000	104,000	.0700	.0100	....	....	
26,500	106,000	.0900	.0200	....	....	
26,690	106,760	.1167	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	106,760
Elastic limit per square inch of original section	do....	58,000
Elongation per inch after rupture	inch..	0.1167
Elongation per inch under strain at elastic limit	do....	.002033
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		1″.50 from neck
Character of broken surface, granular, radiating from a dull spot at the circumference. Minute cracks developed in surface of stem.		
Elongation of inch sections		″.10, ″.16*, ″.09

No. 2996.

Marks, $^{8\ R_1\ C_3}_{B\ T_2\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.		
2, 500	10, 000	.000333	.000233	0.		
3, 750	15, 000	.000500	.000167	0.		
5, 000	20, 000	.000667	.000167	0.		
6, 250	25, 000	.000833	.000166	0.		
7, 500	30, 000	.001000	.000167	0.		
8, 750	35, 000	.001167	.000167	0.		
10, 000	40, 000	.001333	.000166	0.		
11, 250	45, 000	.001500	.000167			
12, 500	50, 000	.001733	.000233			
12, 750	51, 000	.001767	.000034			
13, 000	52, 000	.001833	.000066			
13, 250	53, 000	.001867	.000034			
13, 500	54, 000	.001900	.000033			
13, 750	55, 000	.001933	.000033			
14, 000	56, 000	.002000	.000067			
14, 250	57, 000	.002033	.000033			Elastic limit.
14, 500	58, 000	.002133	.000100			
14, 750	59, 000	.006900	.004767			
15, 000	60, 000	.008000	.001100			
15, 500	62, 000	.009267	.001267			
16, 000	64, 000	.010833	.001566			
16, 500	66, 000	.012000	001167			
17, 000	68, 000	.013333	.001333			
17, 500	70, 000	.014733	.001400			
18, 000	72, 000	.016333	.001600			
18, 500	74, 000	.018167	.001834			
19, 000	76, 000	.020000	.001833			
19, 500	78, 000	.021833	.001833			
20, 000	80, 000	.024000	.002167			
20, 500	82, 000	.026333	.002333			
21, 000	84, 000	.028000	.001667			
21, 500	86, 000	.029967	.001967			
22, 000	88, 000	.033000	.003033			
22, 500	90, 000	.035500	.002500			
23, 000	92, 000	.040000	.004500			
23, 500	94, 000	.044333	.004333			
24, 000	96, 000	.048833	.004500			
24, 500	98, 000	.054167	.005334			
25, 000	100, 000	.0600	.005833			
25, 500	102, 000	.0700	.0100			
26, 000	104, 000	.0933	.0233			
26, 200	104, 800	.1200	.0267			Tensile strength.

General summary.

Specific gravity		7.8461
Hardness		20.47
Tensile strength per square inch of original section	pounds	104, 800
Elastic limit per square inch of original section	do	57, 000
Elongation per inch after rupture	inch	0.1600
Elongation per inch under strain at elastic limit	do	.002033
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		38.4
Position of rupture		″.60 from neck
Character of broken surface		silky
Elongation of inch sections		″.60, ″.12, ″.27

No. 2997.

Marks, $^{\text{S R}_1\text{ C}_2}_{\text{M T}_1\text{ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000700	.000200	0.	....	
6,250	25,000	.000900	.090200	0.	....	
7,500	30,000	.001067	.000167	0.	....	
8,750	35,000	.001233	.000166	0.	....	
10,000	40,000	.001400	.000167	0.	....	
11,250	45,000	.001567	.000167	....	....	
12,500	50,000	.001733	.000166	....	....	
12,750	51,000	.001767	.000034	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001900	.000067	....	....	
13,750	55,000	.001933	.000033	....	....	
14,000	56,000	.001967	.000034	....	....	
14,250	57,000	.002000	.000033	....	....	
14,500	58,000	.002033	.000033	....	....	
14,750	59,000	.002100	.000067	....	....	
15,000	60,000	.002133	.000033	....	....	
15,250	61,000	.002167	.000034	....	....	Elastic limit.
15,500	62,000	.002300	.000133	....	....	
15,750	63,000	.003133	.000833	....	....	
16,000	64,000	.006333	.003200	....	....	
16,500	66,000	.008000	.001667	....	....	
17,000	68,000	.009167	.001167	....	....	
17,500	70,000	.010500	.001333	....	....	
18,000	72,000	.011800	.001300	....	....	
18,500	74,000	.013233	.001433	....	....	
19,000	76,000	.014733	.001500	....	....	
19,500	78,000	.016233	.001500	....	....	
20,000	80,000	.018000	.001767	....	....	
20,500	82,000	.019600	.001600	....	....	
21,000	84,000	.021500	.001900	....	....	
21,500	86,000	.023367	.001867	....	....	
22,000	88,000	.025500	.002133	....	....	
22,500	90,000	.027700	.002200	....	....	
23,000	92,000	.030000	.002300	....	....	
23,500	94,000	.032667	.002667	....	....	
24,000	96,000	.035333	.002666	....	....	
24,500	98,000	.038500	.003167	....	....	
25,000	100,000	.042333	.003833	....	....	
25,500	102,000	.0467	.004367	....	....	
26,000	104,000	.0533	.0066	....	....	
26,500	106,000	.0600	.0067	....	....	
27,000	108,000	.0700	.0100	....	....	
27,500	110,000	.0800	.0100	....	....	
27,810	111,240	.1133	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,240
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1600
Elongation per inch under strain at elastic limit	do....	.002167
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.60 from neck
Character of broken surface		silky, with fine granulation at the circumference
Elongation of inch sections		″.10, ″.10, ″.28*

No. 2998.

Marks, $^{8\,R_1\,C_3}_{M\,T_2\,O}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	**Initial load.**
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	.000033	.000033	
11,250	45,000	.001533	.000200	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001783	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001867	.000067	....	....	
13,750	55,000	.001933	.000066	....	....	**Elastic limit.**
14,000	56,000	.002067	.000134	....	....	
14,250	57,000	.002200	.000133	....	....	
14,500	58,000	.002533	.000333	....	....	
14,750	59,000	.003033	.000500	....	....	
15,000	60,000	.003800	.000767	....	....	
15,500	62,000	.005167	.001367	....	....	
16,000	64,000	.006700	.001533	....	....	
16,500	66,000	.008167	.001467	....	....	
17,000	68,000	.009500	.001333	....	....	
17,500	70,000	.010833	.001333	....	....	
18,000	72,000	.011667	.000834	....	....	
18,500	74,000	.013333	.001666	....	....	
19,000	76,000	.015000	.001667	....	....	
19,500	78,000	.016600	.001600	....	....	
20,000	80,000	.018333	.001733	....	....	
20,500	82,000	.019933	.001600	....	....	
21,000	84,000	.021833	.001900	....	....	
21,500	86,000	.023567	.001734	....	....	
22,000	88,000	.025667	.002100	....	....	
22,500	90,000	.028000	.002333	....	....	
23,000	92,000	.030400	.002400	....	....	
23,500	94,000	.033333	.002933	....	....	
24,000	96,000	.036333	.003000	....	....	
24,500	98,000	.039500	.003167	....	....	
25,000	100,000	.043167	.003667	....	....	
25,500	102,000	.048333	.005166	....	....	
26,000	104,000	.0567	.008367	....	....	
26,500	106,000	.0667	.0100	....	....	
27,000	108,000	.0767	.0100	....	....	
27,500	110,000	.0967	.0200	....	....	
27,650	110,600	.1200	.0233	....	....	**Tensile strength.**

General summary.

Tensile strength per square inch of original section........................pounds.. 110,600
Elastic limit per square inch of original section ....do.... 55,000
Elongation per inch after rupture..inch.. 0.1567
Elongation per inch under strain at elastic limit ....do.... .001933
Reduction in diameter at point of rupture ....do.... .064
Reduction in area after rupture, per centum of original section 21.4
Position of rupture ....1''.40 from neck
Character of broken surface....granular; flaky spot at the circumference. Cracks developed in stem
Elongation of inch sections...''.12, ''.21*, ''.14

No. 2999.

Marks, $\frac{S\ R,\ C_1}{M\ T,\ M}$

Diameter, ''.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001767	.000100	....	....	
13,000	52,000	.001867	.000100	....	....	
13,250	53,000	.001967	.000100	....	....	
13,500	54,000	.002033	.000066	....	....	
13,750	55,000	.002100	.000067	....	....	Elastic limit.
14,000	56,000	.005800	.003700	....	....	
14,250	57,000	.006200	.000400	....	....	
14,500	58,000	.006538	.000338	....	....	
14,750	59,000	.007000	.000467	....	....	
15,000	60,000	.008033	.001033	....	....	
15,500	62,000	.009333	.001300	....	....	
16,000	64,000	.010667	.001334	....	....	
16,500	66,000	.012167	.001500	....	....	
17,000	68,000	.013400	.001233	....	....	
17,500	70,000	.015038	.001638	....	....	
18,000	72,000	.016667	.001634	....	....	
18,500	74,000	.018333	.001666	....	....	
19,000	76,000	.020000	.001667	....	....	
19,500	78,000	.022000	.002000	....	....	
20,000	80,000	.024000	.002000	....	....	
20,500	82,000	.026167	.002167	....	....	
21,000	84,000	.028333	.002166	....	....	
21,500	86,000	.030800	.002467	....	....	
22,000	88,000	.033733	.003133	....	....	
22,500	90,000	.036667	.002934	....	....	
23,000	92,000	.040333	.003666	....	....	
23,500	94,000	.044500	.004167	....	....	
24,000	96,000	.049167	.004667	....	....	
24,500	98,000	.054667	.005500	....	....	
25,000	100,000	.0633	.008633	....	....	
25,500	102,000	.0733	.0100	....	....	
26,000	104,000	.0900	.0167	....	....	
26,250	105,000	.1233	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................pounds.. 105,000

Elastic limit per square inch of original section..................do.... 55,000

Elongation per inch after rupture..................inch.. 0.1400

Elongation per inch under strain at elastic limit..................do.... .002100

Reduction in diameter at point of rupture..................do.... .054

Reduction in area after rupture, per centum of original section.................. 18.3

Position of rupture..................1''.40 from neck

Character of broken surface, granular, radiating from a flaky spot at circumference. Opened cracks in surface of stem.

Elongation of inch sections..................''.12, ''.18*, ''.12

No. 3109.

Marks, $\begin{matrix}8\,E_1\,C\\B\,T_4\,I\end{matrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	....	....	
2,500	10,000	.000333	.000166	....	....	
3,750	15,000	.000500	.000167	....	....	
5,000	20,000	.000667	.000167	....	....	
6,250	25,000	.000833	.000166	....	....	
7,500	30,000	.001000	.000167	....	....	
8,750	35,000	.001167	.000167	....	....	
10,000	40,000	.001333	.000166	....	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001767	.000067	....	....	
13,250	53,000	.001833	.000066	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001933	.000033	....	....	Elastic limit.
14,250	57,000	.002133	.000200	....	....	
14,500	58,000	.002267	.000134	....	....	
14,750	59,000	.002400	.000133	....	....	
15,000	60,000	.002500	.000100	....	....	
15,250	61,000	.003500	.001000	....	....	
15,500	62,000	.004733	.001233	....	....	
16,000	64,000	.006833	.002100	....	....	
16,500	66,000	.009000	.002167	....	....	
17,000	68,000	.010000	.001000	....	....	
17,500	70,000	.011167	.001167	....	....	
18,000	72,000	.012667	.001500	....	....	
18,500	74,000	.013667	.001000	....	....	
19,000	76,000	.016667	.003000	....	....	
19,500	78,000	.018667	.002000	....	....	
20,000	80,000	.020333	.001666	....	....	
20,500	82,000	.022667	.002334	....	....	
21,000	84,000	.024333	.001666	....	....	
21,500	86,000	.026333	.002000	....	....	
22,000	88,000	.028333	.002000	....	....	
22,500	90,000	.031000	.002667	....	....	
23,000	92,000	.033900	.002900	....	....	
23,500	94,000	.037333	.003433	....	....	
24,000	96,000	.041167	.003834	....	....	
24,500	98,000	.045833	.004666	....	....	
25,000	100,000	.0500	.004167	....	....	
25,500	102,000	.0567	.0067	....	....	
26,000	104,000	.0700	.0133	....	....	
26,500	106,000	.0867	.0167	....	....	
26,700	106,800	.1067	.0200	....	....	Tensile strength.

●

General summary.

Tensile strength per square inch of original section	pounds	106,800
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch	0.1067
Elongation per inch under strain at elastic limit	do	.001933
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.95 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.09, ″.12, ″.29

No. 3110.

Marks, $\substack{8\ B_1\ C_3 \\ BT_5\ O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001533	.000200	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001800	.000067	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001933	.000033	....	....	
14,250	57,000	.002000	.000067	....	....	Elastic limit.
14,500	58,000	.002133	.000133	....	....	
14,750	59,000	.002667	.000534	....	....	
15,000	60,000	.004500	.001833	....	....	
15,500	62,000	.006100	.001600	....	....	
16,000	64,000	.007667	.001567	....	....	
16,500	66,000	.009367	.001700	....	....	
17,000	68,000	.010667	.001300	....	....	
17,500	70,000	.012000	.001333	....	....	
18,000	72,000	.013433	.001433	....	....	
18,500	74,000	.015000	.001567	....	....	
19,000	76,000	.016400	.001400	....	....	
19,500	78,000	.018167	.001767	....	....	
20,000	80,000	.020000	.001833	....	....	
20,500	82,000	.022333	.002333	....	....	
21,000	84,000	.024000	.001667	....	....	
21,500	86,000	.026333	.002333	....	....	
22,000	88,000	.028500	.002167	....	....	
22,500	90,000	.031500	.003000	....	....	
23,000	92,000	.034667	.003167	....	....	
23,500	94,000	.037500	.002833	....	....	
24,000	96,000	.040833	.003333	....	....	
24,500	98,000	.0450	.004167	....	....	
25,000	100,000	.0533	.0083	....	....	
25,500	102,000	.0567	.0034	....	....	
26,000	104,000	.0633	.0066	....	....	
26,500	106,000	.0733	.0100	....	....	
27,000	108,000	.1133	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,000
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1783
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		".95 from neck
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		".11, ".14, ".27*

No. 3111.

Marks, $^{8\,E,\,C,}_{B\,T.\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000233	.000133	0.		
3,750	15,000	.000400	.000167	0.		
5,000	20,000	.000600	.000200	0.		
6,250	25,000	.000767	.000167	0.		
7,500	30,000	.000967	.000200	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001333	.000200	0.		
11,250	45,000	.001500	.000167			
12,500	50,000	.001700	.000200			
12,750	51,000	.001733	.000033			
13,000	52,000	.001767	.000034			
13,250	53,000	.001800	.000033			
13,500	54,000	.001833	.000033			
13,750	55,000	.001867	.000034			Elastic limit.
14,000	56,000	.002833	.000966			
14,250	57,000	.003833	.001000			
14,500	58,000	.005000	.001167			
14,750	59,000	.005667	.000667			
15,000	60,000	.007000	.001333			
15,500	62,000	.008000	.001000			
16,000	64,000	.009000	.001000			
16,500	66,000	.010500	.001500			
17,000	68,000	.012333	.001833			
17,500	70,000	.014000	.001667			
18,000	72,000	.015333	.001333			
18,500	74,000	.016667	.001334			
19,000	76,000	.018333	.001666			
19,500	78,000	.020000	.001667			
20,000	80,000	.021667	.001667			
20,500	82,000	.023333	.001666			
21,000	84,000	.025167	.001834			
21,500	86,000	.027500	.002333			
22,000	88,000	.030000	.002500			
22,500	90,000	.032833	.002833			
23,000	92,000	.035500	.002667			
23,500	94,000	.038833	.003333			
24,000	96,000	.042333	.003500			
24,500	98,000	.047000	.004667			
25,000	100,000	.052000	.005000			
25,500	102,000	.0567	.0047			
26,000	104,000	.0667	.0100			
26,500	106,000	.0833	.0166			
26,680	106,720	.1033	.0200			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	106,720
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1167
Elongation per inch under strain at elastic limit	do	.001867
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		".60 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		".18*, ".09, ".08

No. 3112.

Marks, $^{S\,R\,C}_{M\,T\,1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001500	.000167	....	....	
12, 500	50, 000	.001667	.000167	....	....	
13, 750	55, 000	.001900	.000233	....	....	
14, 000	56, 000	.001933	.000033	....	....	
14, 250	57, 000	.001967	.000034	....	....	
14, 500	58, 000	.002000	.000033	....	....	
14, 750	59, 000	.002033	.000033	....	....	
15 000	60, 000	.002067	.000034	....	....	
15, 250	61, 000	.002133	.000066	....	....	
15, 500	62, 000	.002167	.000034	....	....	
15, 750	63, 000	.002200	.000033	....	....	
16, 000	64, 000	.002267	.000067	....	....	
16, 250	65, 000	.002300	.000033	....	....	
16, 500	66, 000	.002333	.000033	....	....	
16, 750	67, 000	.002400	.000067	....	....	Elastic limit.
17, 000	68, 000	.003033	.000633	....	....	
17, 250	69, 000	.004100	.001067	....	....	
17, 500	70, 000	.005267	.001167	....	....	
18, 000	72, 000	.006767	.001500	....	....	
18, 500	74, 000	,008167	.001400	....	....	
19, 000	76, 000	.009467	.001300	....	....	
19, 500	78, 000	.010767	.001300	....	....	
20, 000	80, 000	.012233	.001466	....	....	
20, 500	82, 000	.013567	.001334	....	....	
21, 000	84, 000	.015133	.001566	....	....	
21, 500	86, 000	.016900	.001767	....	....	
22, 000	88, 000	.018333	.001433	....	....	
22, 500	90, 000	.020167	.001834	....	....	
23, 000	92, 000	.022333	.002166	....	....	
23, 500	94, 000	.023767	.001434	....	....	
24, 000	96, 000	.026000	.002233	....	....	
24, 500	98, 000	.028133	.002133	....	....	
25, 000	100, 000	.030500	.002367	....	....	
25, 500	102, 000	.033167	.002667	....	....	
26, 000	104, 000	.036600	.003433	....	....	
26, 500	106, 000	.039500	.002900	....	....	
27, 000	108, 000	.042667	.003167	....	....	
27, 500	110, 000	.0450	.002333	....	....	
28, 000	112, 000	.0533	.0083	....	....	
28, 500	114, 000	.0600	.0067	....	....	
29, 000	116, 000	.0700	.0100	....	....	
29, 500	118, 000	.0967	.0267	....	....	
29, 000	118, 400	.1167	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	118, 400
Elastic limit per square inch of original section	do	67, 000
Elongation per inch after rupture	inch	0. 1567
Elongation per inch under strain at elastic limit	do	.002400
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36. 4
Position of rupture		″.75 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.09, ″.12, ″.26*

No. 3113.

Marks, $^{S\,B_1\,C_3}_{M\,T_5\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000833	.000200	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001400	.000233	0.	....	
11,250	45,000	.001500	.000100	....	....	
12,500	50,000	.001700	.000200	....	....	
13,750	55,000	.001900	.000200	....	....	
14,000	56,000	.001967	.000067	....	....	
14,250	57,000	.002000	.000033	....	....	
14,500	58,000	.002033	.000033	....	....	
14,750	59,000	.002133	.000100	....	....	
15,000	60,000	.002233	.000100	....	....	Elastic limit.
15,250	61,000	.002733	.000500	....	....	
15,500	62,000	.004667	.001934	....	....	
16,000	64,000	.006500	.001833	....	....	
16,500	66,000	.007833	.001333	....	....	
17,000	68,000	.009567	.001734	....	....	
17,500	70,000	.011333	.001766	....	....	
18,000	72,000	.012867	.001534	....	....	
18,500	74,000	.014500	.001633	....	....	
19,000	76,000	.016233	.001733	....	....	
19,500	78,000	.018533	.002300	....	....	
20,000	80,000	.019767	.001234	....	....	
20,500	82,000	.021667	.001900	....	....	
21,000	84,000	.023767	.002100	....	....	
21,500	86,000	.026233	.002466	....	....	
22,000	88,000	.028567	.002334	....	....	
22,500	90,000	.031400	.002833	....	....	
23,000	92,000	.034500	.003100	....	....	
23,500	94,000	.038267	.003767	....	....	
24,000	96,000	.041733	.003466	....	....	
24,500	98,000	.0450	.003267	....	....	
25,000	100,000	.0500	.0050	....	....	
25,500	102,000	.0600	.0100	....	....	
26,000	104,000	.0667	.0067	....	....	
26,500	106,000	.0900	.0233	....	....	
26,700	106,800	.1067	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	106,800
Elastic limit per square inch of original section	do	60,000
Elongation per inch after rupture	inch	0.1400
Elongation per inch under strain at elastic limit	do	.002233
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		1″.50 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.14, ″.18, ″.10

No. 3114.

Marks, $\substack{S\ R_1\ C_2\\M\ T_1\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000700	.000200	0.	....	
6,250	25,000	.000900	.000200	.000033	.000033	
7,500	30,000	.001067	.000167	.000033	0.	
8,750	35,000	.001233	.000166	.000033	0.	
10,000	40,000	.001433	.000200	.000067	.000034	
11,250	45,000	.001600	.000167	....	....	
12,500	50,000	.001800	.000200	....	....	
12,750	51,000	.001833	.000033	....	....	
13,000	52,000	.001867	.000034	....	....	
13,250	53,000	.001900	.000033	....	....	
13,500	54,000	.001967	.000067	....	....	
13,750	55,000	.002033	.000066	....	....	
14,000	56,000	.002067	.000034	....	....	
14,250	57,000	.002100	.000033	....	....	
14,500	58,000	.002167	.000067	....	....	
14,750	59,000	.002233	.000066	....	....	
15,000	60,000	.002300	.000067	....	....	
15,250	61,000	.002400	.000100	....	....	Elastic limit.
15,500	62,000	.002633	.000233	....	....	
15,750	63,000	.003500	.000867	....	....	
16,000	64,000	.005400	.001900	....	....	
16,500	66,000	.006767	.001367	....	....	
17,000	68,000	.008667	.001900	....	....	
17,500	70,000	.010333	.001666	....	....	
18,000	72,000	.012000	.001667	....	....	
18,500	74,000	.013333	.001333	....	....	
19,000	76,000	.014667	.001334	....	....	
19,500	78,000	.015667	.001000	....	....	
20,000	80,000	.016867	.001200	....	....	
20,500	82,000	.018600	.001733	....	....	
21,000	84,000	.020400	.001800	....	....	
21,500	86,000	.022067	.001667	....	....	
22,000	88,000	.024000	.001933	....	....	
22,500	90,000	.026167	.002167	....	....	
23,000	92,000	.028600	.002433	....	....	
23,500	94,000	.031333	.002733	....	....	
24,000	96,000	.034667	.003334	....	....	
24,500	98,000	.037333	.002666	....	....	
25,000	100,000	.040333	.003000	....	....	
25,500	102,000	.0417	.001367	....	....	
26,000	104,000	.0450	.0033	....	....	
26,500	106,000	.0533	.0083	....	....	
27,000	108,000	.0667	.0134	....	....	
27,500	110,000	.0733	.0066	....	....	
28,000	112,000	.1000	.0267	....	....	
28,600	112,240	.1167	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	112,240
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.002400
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.70 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.19*, ″.12, ″.10

HOOP C_4.

No. 3058.

Marks, $^{8\,R_1\,C_4}_{B\,T_1\,I}$

Diameter, ".564.

Sectional area, .25 square inch.

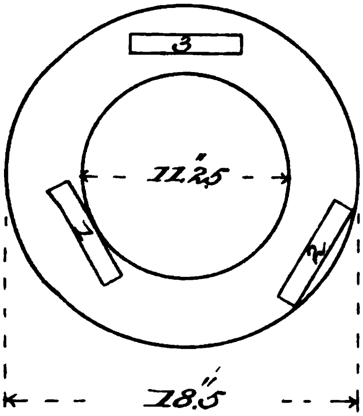
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	**Initial load.**
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	0.	....	
3, 750	15, 000	.000400	.000167	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001233	.000166	....	....	
11, 250	45, 000	.001433	.000200	....	....	
12, 500	50, 000	.001600	.000167	....	....	
12, 750	51, 000	.001633	.000033	....	....	
13, 000	52, 000	.001667	.000034	....	....	
13, 250	53, 000	.001700	.000033	....	....	
13, 500	54, 000	.001767	.000067	....	....	
13, 750	55, 000	.001800	.000033	....	....	
14, 000	56, 000	.001833	.000033	....	....	
14, 250	57, 000	.001867	.000034	....	....	
14, 500	58, 000	.001900	.000033	....	....	
14, 750	59, 000	.001933	.000033	....	....	
15, 000	60, 000	.002000	.000067	....	....	
15, 250	61, 000	.002067	.000067	....	....	
15, 500	62, 000	.002133	.000066	....	....	
15, 750	63, 000	.002167	.000034	....	....	**Elastic limit.**
16, 000	64, 000	.002467	.000300	....	....	
16, 250	65, 000	.003000	.000533	....	....	
16, 500	66, 000	.003900	.000900	....	....	
17, 000	68, 000	.005667	.001767	....	....	
17, 500	70, 000	.007000	.001333	....	....	
18, 000	72, 000	.008000	.001000	....	....	
18, 500	74, 000	.009333	.001333	....	....	
19, 000	76, 000	.010667	.001334	....	....	
19, 500	78, 000	.012033	.001366	....	....	
20, 000	80, 000	.013433	.001400	....	....	
20, 500	82, 000	.014867	.001434	....	....	
21, 000	84, 000	.016333	.001466	....	....	
21, 500	86, 000	.017500	.001167	....	....	
22, 000	88, 000	.019400	.001900	....	....	
22, 500	90, 000	.021167	.001767	....	....	
23, 000	92, 000	.023033	.001866	....	....	
23, 500	94, 000	.024833	.001800	....	....	
24, 000	96, 000	.027067	.002234	....	....	
24, 500	98, 000	.029167	.002100	....	....	
25, 000	100, 000	.031833	.002666	....	....	
25, 500	102, 000	.034500	.002667	....	....	
26, 000	104, 000	.037667	.003167	....	....	
26, 500	106, 000	.041000	.003333	....	....	
27, 000	108, 000	.0450	.0040	....	....	
27, 500	110, 000	.0500	.0050	....	....	
28, 000	112, 000	.0567	.0067	....	....	
28, 500	114, 000	.0667	.0100	....	....	
29, 000	116, 000	.0800	.0133	....	....	
29, 240	116, 960	.1033	.0233	....	....	**Tensile strength.**

General summary.

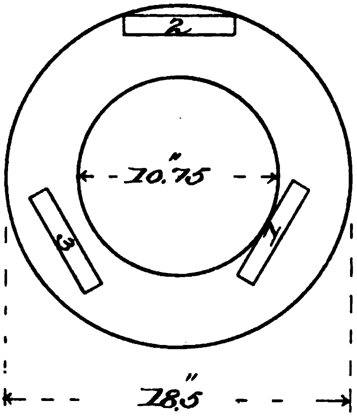
Tensile strength per square inch of original section..............................pounds.. 116,960
Elastic limit per square inch of original section..............................do.... 63,000
Elongation per inch after rupture ....inch.. 0.1467
Elongation per inch under strain at elastic limit ....do.... .002167
Reduction in diameter at point of rupture..............................do ... .114
Reduction in area after rupture, per centum of original section.............................. 36.4
Position of rupture ...."·65 from neck
Character of broken surface..............................granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections.............................."·26*, "·10, "·08

8 inch steel B. L. Rifle

Hoop C4



Breech



Muzzle

No. 3059.

Marks, $\substack{8\,R_1\,C_4 \\ B\,T_2\,O}$
Diameter, ".564.
Sectional area, :25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000767	.000134	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
10, 000	40, 000	.001267	.000167	0.	....	
11, 250	45, 000	.001433	.000166	....	....	
12, 500	50, 000	.001633	.000200	....	....	
12, 750	51, 000	.001700	.000067	....	....	
13, 000	52, 000	.001733	.000033	....	....	
13, 250	53, 000	.001800	.000067	....	....	
13, 500	54, 000	.001867	.000067	....	....	
13, 750	55, 000	.001900	.000033	....	....	
14, 000	56, 000	.001933	.000033	....	....	
14, 250	57, 000	.001967	.000034	....	....	Elastic limit.
14, 500	58, 000	.002100	.000133	....	....	
14, 750	59, 000	.002267	.000167	....	....	
15, 000	60, 000	.002733	.000466	....	....	
15, 500	62, 000	.003900	.001167	....	....	
16, 000	64, 000	.005233	.001333	....	....	
16, 500	66, 000	.006567	.001334	....	....	
17, 000	68, 000	.007833	.001266	....	....	
17, 500	70, 000	.009200	.001367	....	....	
18, 000	72, 000	.010400	.001200	....	....	
18, 500	74, 000	.011800	.001400	....	....	
19, 000	76, 000	.013200	.001400	....	....	
19, 500	78, 000	.014667	.001467	....	....	
20, 000	80, 000	.016167	.001500	....	....	
20, 500	82, 000	.017700	.001533	....	....	
21, 000	84, 000	.019367	.001667	....	....	
21, 500	86, 000	.021333	.001966	....	....	
22, 000	88, 000	.023033	.001700	....	....	
22, 500	90, 000	.025000	.001967	....	....	
23, 000	92, 000	.027167	.002167	....	....	
23, 500	94, 000	.029333	.002166	....	....	
24, 000	96, 000	.032000	.002667	....	....	
24, 500	98, 000	.034833	.002833	....	....	
25, 000	100, 000	.037833	.003000	....	....	
25, 500	102, 000	.041500	.003667	....	....	
26, 000	104, 000	.0467	.0052	....	....	
26, 500	106, 000	.0533	.0066	....	....	
27, 000	108, 000	.0600	.0067	....	....	
27, 500	110, 000	.0667	.0067	....	....	
28, 000	112, 000	.0867	.0200	....	....	
28, 200	112, 800	.1067	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	112, 800
Elastic limit per square inch of original section	do....	57, 000
Elongation per inch after rupture	inch..	0. 1567
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21. 4
Position of rupture		"1 12 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		".13, ".19⁴, ".15

No. 3060.

Marks, $^{8\ \mathrm{E}_1\ \mathrm{C}_4}_{\mathrm{B}\ \mathrm{T}_3\ \mathrm{M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000567	.000134	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001233	.000166	0.	....	
11,250	45,000	.001433	.000200	....	....	
12,500	50,000	.001633	.000200	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001833	.000100	....	....	
13,750	55,000	.001900	.000067	....	....	Elastic limit.
14,000	56,000	.002133	.000233	....	....	
14,250	57,000	.002500	.000367	....	....	
14,500	58,000	.003300	.000800	....	....	
14,750	59,000	.003733	.000433	....	....	
15,000	60,000	.004567	.000834	....	....	
15,500	62,000	.005667	.001100	....	....	
16,000	64,000	.007000	.001333	....	....	
16,500	66,000	.008200	.001200	....	....	
17,000	68,000	.009567	.001367	....	....	
17,500	70,000	.010667	.001100	....	....	
18,000	72,000	.012100	.001433	....	....	
18,500	74,000	.013667	.001567	....	....	
19,000	76,000	.015233	.001566	....	....	
19,500	78,000	.016500	.001267	....	....	
20,000	80,000	.018333	.001833	....	....	
20,500	82,000	.019833	.001500	....	....	
21,000	84,000	.021733	.001900	....	....	
21,500	86,000	.023500	.001767	....	....	
22,000	88,000	.025500	.002000	....	....	
22,500	90,000	.028000	.002500	....	....	
23,000	92,000	.030500	.002500	....	....	
23,500	94,000	.032667	.002167	....	....	
24,000	96,000	.035833	.003166	....	....	
24,500	98,000	.038833	.003000	....	....	
25,000	100,000	.0433	.004467	....	....	
25,500	102,000	.0467	.0034	....	....	
26,000	104,000	.0500	.0033	....	....	
26,500	106,000	.0567	.0067	....	....	
27,000	108,000	.0667	.0100	....	....	
27,500	110,000	.0900	.0233	....	....	
27,700	110,800	.0967	.0067	....	....	Tensile strength.

General summary.

Specific gravity		7.8500
Hardness		21.64
Tensile strength per square inch of original section	pounds..	110,800
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch..	0.1567
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		".75 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".09, ".12, ".26

No. 3061.

Marks, $^{8\,R,\,C,}_{M\,T,\,1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.900167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001700	.000067	....	....	
13, 000	52, 000	.001767	.000067	....	....	
13, 250	53, 000	.001800	.000033	....	....	
13, 500	54, 000	.001833	.000033	....	....	
13, 750	55, 000	.001867	.000034	....	....	
14, 000	56, 000	.001900	.000033	....	....	
14, 250	57, 000	.001933	.000033	....	....	
14, 500	58, 000	.001967	.000034	....	....	
14, 750	59, 000	.002033	.000066	....	....	
15, 000	60, 000	.002133	.000100	....	....	
15, 250	61, 000	.002200	.000067	....	....	Elastic limit.
15, 500	62, 000	.002367	.000167	....	....	
15, 750	63, 000	.002700	.000333	....	....	
16, 000	64, 000	.003567	.000867	....	....	
16, 500	66, 000	.005233	.001666	....	....	
17, 000	68, 000	.006567	.001834	....	....	
17, 500	70, 000	.008000	.001433	....	....	
18, 000	72, 000	.009167	.001167	....	....	
18, 500	74, 000	.010400	.001233	....	....	
19, 000	76, 000	.011733	.001333	....	....	
19, 500	78, 000	.013333	.001600	....	....	
20, 000	80, 000	.014700	.001367	....	....	
20, 500	82, 000	.016000	.001300	....	....	
21, 000	84, 000	.017667	.001667	....	....	
21, 500	86, 000	.019200	.001533	....	....	
22, 000	88, 000	.021267	.002067	....	....	
22, 500	90, 000	.022500	.001233	....	....	
23, 000	92, 000	.024667	.002167	....	....	
23, 500	94, 000	.027067	.002400	....	....	
24, 000	96, 000	.029000	.001933	....	....	
24, 500	98, 000	.031333	.002333	....	....	
25, 000	100, 000	.034167	.002834	....	....	
25, 500	102, 000	.037000	.002833	....	....	
26, 000	104, 000	.040500	.003500	....	....	
26, 500	106, 000	.0433	.0028	....	....	
27, 000	108, 000	.0467	.0034	....	....	
27, 500	110, 000	.0567	.0100	....	....	
28, 000	112, 000	.0633	.0066	....	....	
28, 500	114, 000	.0733	.0100	....	....	
28, 850	115, 400	.1067	.0334	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	115, 400
Elastic limit per square inch of original section	do	61, 000
Elongation per inch after rupture	inch..	0. 1300
Elongation per inch under strain at elastic limit	do	.002200
Reduction in diameter at point of rupture	do ...	.054
Reduction in area after rupture, per centum of original section		18. 8
Position of rupture		″.75 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.16, ″.11, ″.12

No. 3062.

Marks, $\genfrac{}{}{0pt}{}{8\,R_1\,C_4}{M\,T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001267	.000200	0.	....	
11, 250	45, 000	.001467	.000200	....	....	
12, 500	50, 000	.001700	.000233	....	....	
12, 750	51, 000	.001733	.000033	....	....	
13, 000	52, 000	.001767	.000034	....	....	
13, 250	53, 000	.001800	.000033	....	....	
13, 500	54, 000	.001867	.000067	....	....	
13, 750	55, 000	.001900	.000033	....	....	Elastic limit.
14, 000	56, 000	.002033	.000133	....	....	
14, 250	57, 000	.002133	.000100	....	....	
14, 500	58, 000	.002467	.000334	....	....	
14, 750	59, 000	.003500	.001033	....	....	
15, 000	60, 000	.005333	.001833	....	....	
15, 500	62, 000	.006500	.001167	....	....	
16, 000	64, 000	.007833	.001333	....	....	
16, 500	60, 000	.009100	.001267	....	....	
17, 000	68, 000	.010333	.001233	....	....	
17, 500	70, 000	.011700	.001367	....	....	
18, 000	72, 000	.013200	.001500	....	....	
18, 500	74, 000	.014667	.001467	....	....	
19, 000	76, 000	.016167	.001500	....	....	
19, 500	78, 000	.017700	.001533	....	....	
20, 000	80, 000	.019333	.001633	....	....	
20, 500	82, 000	.021167	.001834	....	....	
21, 000	84, 000	.023033	.001866	....	....	
21, 500	86, 000	.025200	.002167	....	....	
22, 000	88, 000	.027333	.002133	....	....	
22, 500	90, 000	.029700	.002367	....	....	
23, 000	92, 000	.033000	.003300	....	....	
23, 500	94, 000	.035333	.002338	....	....	
24, 000	96, 000	.038333	.003000	....	....	
24, 500	98, 000	.041833	.00 500	....	....	
25, 000	100, 000	.046000	.004167	....	....	
25, 500	102, 000	.0500	.0040	....	....	
26, 000	104, 000	.0567	.0067	....	....	
26, 5 0	106, 000	.0633	.0066	....	....	
27, 000	108, 000	.0800	.0167	....	....	
27, 320	109, 280	.1100	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	109, 280
Elastic limit per square inch of original section	do	55, 000
Elongation per inch after rupture	inch	0. 1767
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.084
Reduction in area after rupture, per centum of original section		27. 6
Position of rupture		1″.45 from neck
Character of broken surface		granular; silky spot at circumference
Elongation of inch sections		″.11, ″.26*, ″.16

No. 3063.

Marks, $\begin{smallmatrix}8\,R_1\,C_4\\ M\,T_2\,M\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000300	.000200	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.009166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001333	.000200	0.	....	
12, 250	45, 000	.001500	.000167	....	....	
12, 500	50, 000	.001733	.000233	....	....	
12, 750	51, 000	.001767	.000034	....	....	
13, 000	52, 000	.001833	.000066	....	....	Elastic limit.
13, 250	53, 000	.002033	.000200	....	....	
13, 500	54, 000	.003033	.001000	....	....	
13, 750	55, 000	.003733	.000700	....	....	
14, 000	56, 000	.005067	.001334	....	....	
14, 250	57, 000	.005600	.000533	....	....	
14, 500	58, 000	.006133	.000533	....	....	
14, 750	59, 000	.006667	.000534	....	....	
15, 000	60, 000	.007367	.000700	....	....	
15, 500	62, 000	.008600	.001233	....	....	
16, 000	64, 000	.009900	.001300	....	....	
16, 500	66, 000	.011233	.001333	....	....	
17, 000	68, 000	.012700	.001467	....	....	
17, 500	70, 000	.014167	.001467	....	....	
18, 000	72, 000	.015833	.001666	....	....	
18, 500	74, 000	.017233	.001400	....	....	
19, 000	76, 000	.018933	.001700	....	....	
19, 500	78, 000	.020833	.001900	....	....	
20, 000	80, 000	.022500	.001667	....	....	
20, 500	82, 000	.024333	.001833	....	....	
21, 000	84 000	.026667	.002334	....	....	
21, 500	86, 000	.028667	.002000	....	....	
22, 000	88, 000	.031033	.002366	....	....	
22, 500	90, 000	.034167	.003134	....	....	
23, 000	92, 000	.036667	.002500	....	....	
23, 500	94, 000	.040167	.003500	....	....	
24, 000	96, 000	.043900	.003733	....	....	
24, 500	98, 000	.0467	.0028	....	....	
25, 000	100, 000	.0533	.0066	....	....	
25, 500	102, 000	.0600	.0067	....	....	
26, 000	104, 000	.0667	.0067	....	....	
26, 500	106, 000	.1000	.0333	....	....	
26, 600	106, 400	.1067	.0067	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	**106, 400**
Elastic limit per square inch of original section .... do....	**52, 000**
Elongation per inch after rupture .... inch..	**0. 1500**
Elongation per inch under strain at elastic limit .... do....	**.001833**
Reduction in diameter at point of rupture .... do....	**.084**
Reduction in area after rupture, per centum of original section	**27. 6**
Position of rupture	**″.95 from neck**
Character of broken surface	**granular; silky center**
Elongation of inch sections	**″.10, ″.13, ″.22***

No. 3089.

Marks, $\substack{8\,R_1\,C_4 \\ M\,T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000800	.000200	0.	....	
7, 500	30, 000	.001000	.000200	0.	....	
8, 750	35, 000	.001200	.000200	....	....	
10, 000	40, 000	.001367	.000167	....	....	
11, 250	45, 000	.001533	.000166	....	....	
12, 500	50, 000	.001733	.000200	....	....	
12, 750	51, 000	.001767	.000034	....	....	
13, 000	52, 000	.001800	.000033	....	....	
13, 250	53, 000	.001833	.000033	....	....	
13, 500	54, 000	.001867	.000034	....	....	
13, 750	55, 000	.001900	.000033	....	....	
14, 000	56, 000	.001933	.000033	....	....	
14, 250	57, 000	.001967	.000034	....	....	
14, 500	58, 000	.002033	.000066	....	....	
14, 750	59, 000	.002067	.000034	....	....	
15, 000	60, 000	.002100	.000033	....	....	
15, 250	61, 000	.002133	.000033	....	....	
15, 500	62, 000	.002233	.000100	....	....	
15, 750	63, 000	.002300	.000067	....	....	Elastic limit.
16, 000	64, 000	.002433	.000133	....	....	
16, 250	65, 000	.002700	.000267	....	....	
16, 500	66, 000	.004167	.001467	....	....	
17, 000	68, 000	.005600	.001433	....	....	
17, 500	70, 000	.007100	.001500	....	....	
18, 000	72, 000	.008167	.001067	....	....	
18, 500	74, 000	.009533	.001366	....	....	
19, 000	76, 000	.010800	.001267	....	....	
19, 500	78, 000	.012167	.001367	....	....	
20, 000	80, 000	.013667	.001500	....	....	
20, 500	82, 000	.015167	.001500	....	....	
21, 000	84, 000	.016333	.001166	....	....	
21, 500	86, 000	.018000	.001667	....	....	
22, 000	88, 000	.019667	.001667	....	....	
22, 500	90, 000	.022000	.002333	....	....	
23, 000	92, 000	.023667	.001667	....	....	
23, 500	94, 000	.025600	.001933	....	....	
24, 000	96, 000	.028000	.002200	....	....	
24, 500	98, 000	.029833	.001833	....	....	
25, 000	100, 000	.032267	.002434	....	....	
25, 500	102, 000	.035167	.002900	....	....	
26, 000	104, 000	.038533	.003366	....	....	
26, 500	106, 000	.042167	.003634	....	....	
27, 000	108, 000	.046333	.004166	....	....	
27, 500	110, 000	.0533	.006967	....	....	
28, 000	112, 000	.0567	.0034	....	....	
28, 500	114, 000	.0667	.0100	....	....	
29, 000	116, 000	.0900	.0233	....	....	
29, 140	116, 560	.1067	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	116, 560
Elastic limit per square inch of original section .... do....	63, 000
Elongation per inch after rupture .... inch..	0. 1067
Elongation per inch under strain at elastic limit .... do....	.002300
Reduction in diameter at point of rupture .... do....	.114
Reduction in area after rupture, per centum of original section	36.4
Position of rupture	1″ from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.12, ″.16, ″.21

No. 3090.

Marks, $\overset{8\,B,\,C_4}{M\,T_5\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

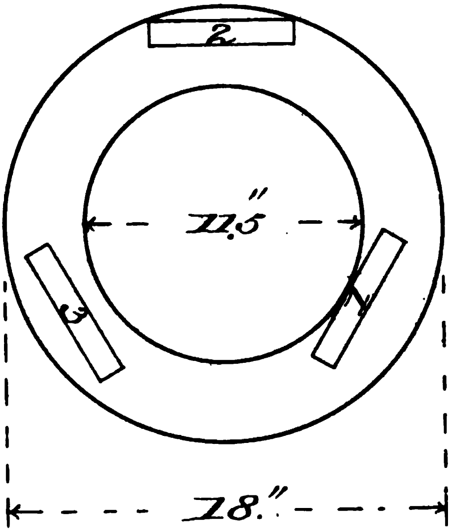
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	
1, 250	5, 000	.000133	.000133	0.	....	Initial load.
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001767	.000067	....	....	
13, 500	54, 000	.001800	.000033	....	....	
13, 750	55, 000	.001867	.000067	....	....	
14, 000	56, 000	.001933	.000066	....	....	
14, 250	57, 000	.002000	.000067	....	....	Elastic limit.
14, 500	58, 000	.002100	.000100	....	....	
14, 750	59, 000	.003200	.001200	....	....	
15, 000	60, 000	.004400	.001200	....	....	
15, 500	62, 000	.005833	.001433	....	....	
16, 000	64, 000	.007167	.001334	....	....	
16, 500	66, 000	.008500	.001333	....	....	
17, 000	68, 000	.009667	.001167	....	....	
17, 500	70, 000	.011167	.001500	....	....	
18, 000	72, 000	.012533	.001366	....	....	
18, 500	74, 000	.013833	.001300	....	....	
19, 000	76, 000	.015333	.001500	....	....	
19, 000	78, 000	.016900	.001567	....	....	
20, 000	80, 000	.018500	.001600	....	....	
20, 500	82, 000	.020233	.001733	....	....	
21, 000	84, 000	.022167	.001934	....	....	
21, 500	86, 000	.024000	.001833	....	....	
22, 000	88, 000	.02 133	.002133	....	....	
22, 500	90, 000	.028267	.002134	....	....	
23, 000	92, 000	.030900	.002633	....	....	
23, 500	94, 000	.033667	.002767	....	....	
24, 000	96, 000	.036667	.003000	....	....	
24, 500	98, 000	.040000	.003333	....	....	
25, 000	100, 000	.0433	.0033	....	....	
25, 500	102, 000	.0467	.0034	....	....	
26, 000	104, 000	.0567	.0100	....	....	
26, 500	106, 000	.0633	.0066	....	....	
27, 000	108, 000	.0700	.0067	....	....	
27, 490	109, 960	.1133	.0483	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	109, 960
Elastic limit per square inch of original section ....do....	57, 000
Elongation per inch after rupture ....inch..	0. 1400
Elongation per inch under strain at elastic limit ....do....	.002000
Reduction in diameter at point of rupture ....do....	.064
Reduction in area after rupture, per centum of original section	21. 4
Position of rupture	1″.35 from neck
Character of broken surface	granular; silky spot near the circumference
Elongation of inch sections	″.10, ″.20*, ″.12

8 inch steel B.L. Rifle

Hoop C5



HOOP C_9.

No. 2889.

Marks, $\frac{{}^{8}B_1C_3}{T_1I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000367	.000200	0.	....	
3, 750	15, 000	.000533	.000166	0.	....	
5, 000	20, 000	.000700	.000167	0.	....	
6, 250	25, 000	.000867	.000167	0.	....	
7, 500	30, 000	.001033	.000166	0.	....	
8, 750	35, 000	.001200	.000167	0.	....	
10, 000	40 000	.001367	.000167	0.	....	
11, 250	45, 000	.001533	.000166	....	....	
11, 500	46, 000	.001567	.000034	....	....	
11, 750	47, 000	.001600	.000033	....	....	
12, 000	48, 000	.001633	.000033	....	....	
12, 250	49, 000	.001667	.000034	....	....	
12, 500	50, 000	.001700	.000033	....	....	
12, 750	51, 000	.001733	.000033	....	....	
13, 000	52, 000	.001767	.000034	....	....	
13, 250	53, 000	.001800	.000033	....	....	
13, 500	54, 000	.001833	.000033	....	....	
13, 750	55, 000	.001867	.000034	....	....	
14, 000	56, 000	.001933	.000066	....	....	
14, 250	57, 000	.002000	.000067	....	....	Elastic limit.
14, 500	58, 000	.003233	.001233	....	....	
14, 750	59, 000	.004667	.001434	....	....	
15, 000	60, 000	.006667	.002000	....	....	
15, 500	62, 000	.008500	.001833	....	....	
16, 000	64, 000	.010333	.001833	....	....	
16, 500	66, 000	.012167	.001834	....	....	
17, 000	68, 000	.013767	.001600	....	....	
17, 500	70, 000	.015467	.001700	....	....	
18, 000	72, 000	.017400	.001933	....	....	
18, 500	74, 000	.019667	.002267	....	....	
19, 000	76, 000	.021700	.002033	....	....	
19, 500	78, 000	.024 67	.002467	....	....	
20, 000	80, 000	.026667	.002500	....	....	
20, 500	82, 000	.029333	.002666	....	....	
21, 000	84, 000	.032433	.003100	....	....	
21, 500	86, 000	.036333	.003900	....	....	
22, 000	88, 000	.039667	.003334	....	....	
22, 500	90, 000	.045333	.005666	....	....	
23, 000	92, 000	.050667	.005334	....	....	
23, 500	94, 000	.057333	.006666	....	....	
24, 000	96, 000	.0667	.009367	....	....	
24, 500	98, 000	.0867	.0200	....	....	
24, 700	98, 800	.1167	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	98, 800
Elastic limit per square inch of original section	do ..	57, 000
Elongation per inch after rupture	inch..	0 2100
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do ...	.184
Reduction in area after rupture, per centum of original section	..	54. 0
Position of rupture		1″.55 from neck
Character of broken surface		fine, silky
Elongation of inch sections		″.10, ″.38*, ″.15

No. 2890.

Marks, $^{3}\overset{B_1\,C_5}{T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000433	.000100	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001100	.000133	0.	....	
10,000	40,000	.001267	.000167	0.	....	
11,250	45,000	.001433	.000166	....	....	
11,500	46,000	.001467	.000034	....	....	
11,750	47,000	.001500	.000033	....	....	
12,000	48,000	.001567	.000067	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001633	.000033	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001867	.000067	....	....	
14,250	57,000	.001933	.000066	....	....	Elastic limit.
14,500	58,000	.003667	.001734	....	....	
14,750	59,000	.005333	.001666	....	....	
15,000	60,000	.003333	.001000	....	....	
15,500	62,000	.007843	.001500	....	....	
16,000	64,000	.009233	.001400	....	....	
16,500	66,000	.011000	.001767	....	....	
17,000	68,000	.012667	.001667	....	....	
17,500	70,000	.014433	.001766	....	....	
18,000	72,000	.016167	.001734	....	....	
18,500	74,000	.018100	.001933	....	....	
19,000	76,000	.020167	.002067	....	....	
19,500	78,000	.022667	.002500	....	....	
20,000	80,000	.024833	.002166	....	....	
20,500	82,000	.027500	.002667	....	....	
21,000	84,000	.030000	.002500	....	....	
21,500	86,000	.033033	.003033	....	....	
22,000	88,000	.036667	.003634	....	....	
22,500	90,000	.041000	.004333	....	....	
23,000	92,000	.046000	.005000	....	....	
23,500	94,000	.051500	.005500	....	....	
24,000	96,000	.0633	.0118	....	....	
24,500	98,000	.0733	.0100	....	....	
25,000	100,000	.1000	.0267	....	....	
25,000	100,240	.1100	.0100	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,240
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1967
Elongation per inch under strain at elastic limit	do....	.001933
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section.		44.6
Position of rupture		1″.20 from neck
Character of broken surface		silky; opened crack in stem near point of rupture
Elongation of inch sections		″.10, ″.30*, ″.19

No. 2891.

Marks, ${}^{8}{}^{R_1\,C_5}_{T_3\,M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167	0.		
10,000	40,000	.001333	.000166	0.		
11,250	45,000	.001500	.000167			
11,500	46,000	.001533	.000033			
11,750	47,000	.001567	.000034			
12,000	48,000	.001600	.000033			
12,250	49,000	.001633	.000033			
12,500	50,000	.001667	.000034			
12,750	51,000	.001700	.000033			
13,000	52,000	.001733	.000033			
13,250	53,000	.001767	.000034			
13,500	54,000	.001800	.000033			
13,750	55,000	.001833	.000033			Elastic limit.
14,000	56,000	.002000	.000167			
14,250	57,000	.003100	.001100			
14,500	58,000	.004867	.001767			
14,750	59,000	.005833	.000966			
15,000	60,000	.007067	.001234			
15,500	62,000	.008567	.001500			
16,000	64,000	.009933	.001366			
16,500	66,000	.011367	.001434			
17,000	68,000	.013000	.001633			
17,500	70,000	.014833	.001833			
18,000	72,000	.016533	.001700			
18,500	74,000	.018233	.001700			
19,000	76,000	.020233	.002000			
19,500	78,000	.022333	.002100			
20,000	80,000	.024600	.002267			
20,500	82,000	.027067	.002467			
21,000	84,000	.029667	.002600			
21,500	86,000	.032833	.003166			
22,000	88,000	.036000	.003167			
22,500	90,000	.040167	.004167			
23,000	92,000	.044867	.004700			
23,500	94,000	.050000	.005133			
24,000	96,000	.0567	.0067			
24,500	98,000	.0667	.0100			
25,000	100,000	.0867	.0200			
25,410	101,640	.1267	.0400			Tensile strength.

General summary.

Specific gravity		7.8484
Hardness		20.03
Tensile strength per square inch of original section	pounds	101,640
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1933
Elongation per inch under strain at elastic limit	do	.001833
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1″.60 from neck
Character of broken surface		silky; 50 per cent. of surface interspersed with fine granulation
Elongation of inch sections		″.13, ″.33*, ″.12

SECOND HOOP C_5.

No. 3222.

Marks, $\overset{8\ R_1\ C_5}{B\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	−.000033	− .000033	
10,000	40,000	.001300	.000167	−.000033	0.	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001700	.000067	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001867	.000067	....	....	
14,000	56,000	.001900	.000033	....	....	
14,250	57,000	.001933	.000033	....	....	
14,500	58,000	.001967	.000034	....	....	
14,750	59,000	.002000	.000033	....	....	
15,000	60,000	.002033	.000033	....	....	Elastic limit.
15,250	61,000	.002133	.000100	....	....	
15,500	62,000	.002467	.000334	....	....	
15,750	63,000	.002733	.000266	....	....	
16,000	64,000	.003333	.000600	....	....	
16,500	66,000	.004533	.001200	....	....	
17,000	68,000	.005867	.001334	....	....	
17,500	70,000	.007067	.001200	....	....	
18,000	72,000	.008667	.001600	....	....	
18,500	74,000	.010000	.001333	....	....	
19,000	76,000	.011667	.001667	....	....	
19,500	78,000	.013267	.001600	....	....	
20,000	80,000	.014000	.000733	....	....	
20,500	82,000	.015333	.001333	....	....	
21,000	84,000	.016833	.001500	....	....	
21,500	86,000	.018833	.002000	....	....	
22,000	88,000	.020400	.001567	....	....	
22,500	90,000	.022167	.001767	....	....	
23,000	92,000	.023933	.001766	....	....	
23,500	94,000	.025667	.001734	....	....	
24,000	96,000	.027833	.002166	....	....	
24,500	98,000	.030200	.002367	....	....	
25,000	100,000	.033000	.002800	....	....	
25,500	102,000	.036167	.003167	....	....	
26,000	104,000	.039667	.003500	....	....	
26,500	106,000	.042833	.003166	....	....	
27,000	108,000	.047333	.004500	....	....	
27,500	110,000	.0533	.005967	....	....	
28,000	112,000	.0600	.0067	....	....	
28,500	114,000	.0733	.0133	....	....	
28,960	115,840	.1067	.0334	....	....	Tensile strength.

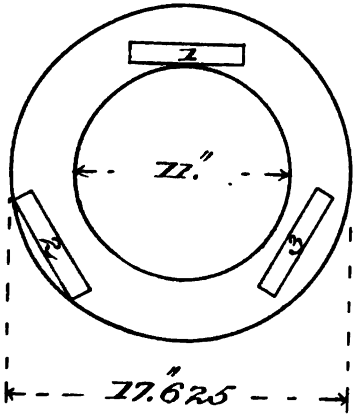
General summary.

Tensile strength per square inch of original section..........pounds.. 115,840
Elastic limit per square inch of original section..........do.... 60,000
Elongation per inch after rupture..........inch.. 0.1633
Elongation per inch under strain at elastic limit..........do.... .002033
Reduction in diameter at point of rupture..........do.... .104
Reduction in area after rupture, per centum of original section.......... 33.5
Position of rupture..........″.65 from neck
Character of broken surface..........granular; silky center
Elongation of inch sections..........″.24*, ″.18, ″.13

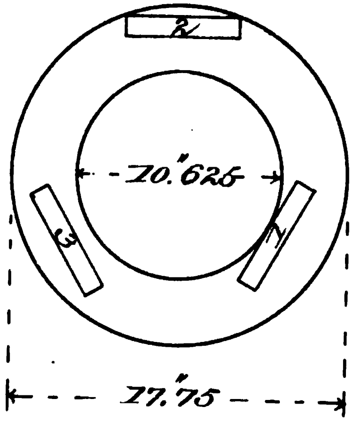
8 inch steel B. L. Rifle

Second hoop C5

Breech



Muzzle



No. 3223.

Marks, $^{8\ R_1\ C_5}_{B\ T_2\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001300	.000200	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001700	.000233	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001833	.000033	....	....	
13,750	55,000	.001900	.000067	....	....	
14,000	56,000	.001967	.000067	....	....	
14,250	57,000	.002033	.000066	....	....	Elastic limit.
14,500	58,000	.002233	.000200	....	....	
14,750	59,000	.002700	.000467	....	....	
15,000	60,000	.003233	.000533	....	....	
15,500	62,000	.004067	.000834	....	....	
16,000	64,000	.005333	.001266	....	....	
16,500	66,000	.006500	.001167	....	....	
17,000	68,000	.007833	.001333	....	....	
17,500	70,000	.009000	.001167	....	....	
18,000	72,000	.010333	.001333	....	....	
18,500	74,000	.011567	.001234	....	....	
19,000	76,000	.012933	.001366	....	....	
19,500	78,000	.014333	.001400	....	....	
20,000	80,000	.015833	.001500	....	....	
20,500	82,000	.017167	.001334	....	....	
21,000	84,000	.018833	.001666	....	....	
21,500	86,000	.020667	.001834	....	....	
22,000	88,000	.022067	.001400	....	....	
22,500	90,000	.023733	.001666	....	....	
23,000	92,000	.026000	.002267	....	....	
23,500	94,000	.029000	.003000	....	....	
24,000	96,000	.030200	.002200	....	....	
24,500	98,000	.032667	.002467	....	....	
25,000	100,000	.036333	.003666	....	....	
25,500	102,000	.039667	.003334	....	....	
26,000	104,000	.043000	.003333	....	....	
26,500	106,000	.046767	.003767	....	....	
27,000	108,000	.0533	.006533	....	....	
27,500	110,000	.0600	.0067	....	....	
28,000	112,000	.0700	.0100	....	....	
28,420	113,680	.1000	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	113,680
Elastic limit per square inch of original section	do	57,000
Elongation per inch after rupture	inch	0.1433
Elongation per inch under strain at elastic limit	do	.002033
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		at middle of stem
Character of broken surface		granular; silky center
Elongation of inch sections		″.10, ″.24*, ″.09

No. 3224.

Marks, $^{8\ R,\ C_8}_{B\ T_3 M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001133	.000133	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001700	.000233	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	Elastic limit.
13,250	53,000	.001867	.000100	....	....	
13,500	54,000	.002100	.000233	....	....	
13,750	55,000	.002433	.000333	....	....	
14,000	56,000	.003033	.000600	....	....	
14,250	57,000	.003533	.000500	....	....	
14,500	58,000	.004033	.000500	....	....	
14,750	59,000	.004567	.000534	....	....	
15,000	60,000	.005133	.000566	....	....	
15,500	62,000	.006567	.001434	....	....	
16,000	64,000	.007533	.000966	....	....	
16,500	66,000	.008800	.001267	....	....	
17,000	68,000	.010200	.001400	....	....	
17,500	70,000	.011333	.001133	....	....	
18,000	72,000	.012700	.001367	....	....	
18,500	74,000	.014400	.001700	....	....	
19,000	76,000	.015500	.001100	....	....	
19,500	78,000	.017067	.001567	....	....	
20,000	80,000	.018767	001700	....	....	
20,500	82,000	.020400	.001633	....	....	
21,000	84,000	.021767	.001367	....	....	
21,500	86,000	.023700	.001933	....	....	
22,000	88,000	.025667	.001967	....	....	
22,500	90,000	.027833	.002166	....	....	
23,000	92,000	.030233	.002400	....	....	
23,500	94,000	.033000	.002767	....	....	
24,000	96,000	.035000	.002000	....	....	
24,500	98,000	.0367	.0017	....	....	
25,000	100,000	.0417	.0050	....	....	
25,500	102,000	.0450	.0033	....	....	
26,000	104,000	.0567	.0117	....	....	
26,500	106,000	.0633	.0066	....	....	
27,000	108,000	.0700	.0067	....	....	
27,500	110,000	.1000	.0300	....	....	
27,550	110,200	.1067	.0067	....	....	Tensile strength.

General summary.

Specific gravity		7.8509
Hardness		23.03
Tensile strength per square inch of original section	pounds	110,200
Elastic limit per square inch of original section	do	52,000
Elongation per inch after rupture	inch	0.1367
Elongation per inch under strain at elastic limit	do	.001767
Reduction in diameter at point of rupture	do	.004
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.70 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.21*, ″.13, ″.0

No. 3225.

Marks, $^{\text{S R, C}}_{\text{M T, I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001600	.000167	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001733	.000066	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001833	.000033	....	....	
14,250	57,000	.001867	.000034	....	....	
14,500	58,000	.001900	.000033	....	....	
14,750	59,000	.001967	.000067	....	....	Elastic limit.
15,000	60,000	.002133	.000166	....	....	
15,250	61,000	.002300	.000167	....	....	
15,500	62,000	.002767	.000467	....	....	
15,750	63,000	.003167	.000400	....	....	
16,000	64,000	.003733	.000566	....	....	
16,500	66,000	.004900	.001167	....	....	
17,000	68,000	.006333	.001433	....	....	
17,500	70,000	.007233	.000900	....	....	
18,000	72,000	.008500	.001267	....	....	
18,500	74,000	.009867	.001867	....	....	
19,000	76,000	.011167	.001300	....	....	
19,500	78,000	.012500	.001333	....	....	
20,000	80,000	.013833	.001333	....	....	
20,500	82,000	.015200	.001367	....	....	
21,000	84,000	.016600	.001400	....	....	
21,500	86,000	.018267	.001667	....	....	
22,000	88,000	.020100	.001833	....	....	
22,500	90,000	.022000	.001900	....	....	
23,000	92,000	.023333	.001333	....	....	
23,500	94,000	.025500	.002167	....	....	
24,000	96,000	.027500	.002000	....	....	
24,500	98,000	.029667	.002167	....	....	
25,000	100,000	.032167	.002500	....	....	
25,500	102,000	.035667	.003500	....	....	
26,000	104,000	.038667	.003000	....	....	
26,500	106,000	.0417	.003033	....	....	
27,000	108,000	.0450	.0033	....	....	
27,500	110,000	.0500	.0050	....	....	
28,000	112,000	.0567	.0067	....	....	
28,500	114,000	.0667	.0100	....	....	
29,000	116,000	.0867	.0200	....	....	
29,190	116,760	.1100	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	116,760
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1567
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.85 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.23*, ″.12, ″.12

No. 3226.

Marks, $\overset{S\ R_1\ C_5}{M\ T_2\ O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.		
2, 500	10, 000	.000333	.000166	0.		
3, 750	15, 000	.000500	.000167	0.		
5, 000	20, 000	.000667	.000167	0.		
6, 250	25, 000	.000833	.000167	0.		
7, 500	30, 000	.001000	.000167	0.		
8, 750	35, 000	.001200	.000200	.000033	.000033	
10, 000	40, 000	.001367	.000167	.000033	0.	
11, 250	45, 000	.001533	.000166			
12, 500	50, 000	.001700	.000167			
12, 750	51, 000	.001767	.000067			
13, 000	52, 000	.001800	.000033			
13, 250	53, 000	.001833	.000033			
13, 500	54, 000	.001867	.000034			
13, 750	55, 000	.001933	.000066			
14, 000	56, 000	.002000	.000067			
14, 250	57, 000	.002100	.000100			
14, 500	58, 000	.002167	.000067			
14, 750	59, 000	.002200	.000033			
15, 000	60, 000	.002232	.000033			Elastic limit.
15, 250	61, 000	.002367	.000134			
15, 500	62, 000	.002667	.000300			
15, 750	63, 000	.003100	.000433			
16, 000	64, 000	.003467	.000367			
16, 500	66, 000	.004833	.001366			
17, 000	68, 000	.006000	.001167			
17, 500	70, 000	.007333	.001333			
18, 000	72, 000	.008467	.001134			
18, 500	74, 000	.009700	.001233			
19, 000	76, 000	.011167	.001467			
19, 500	78, 000	.012167	.001000			
20, 000	80, 000	.013500	.001333			
20, 500	82, 000	.015033	.001533			
21, 000	84, 000	.016567	.001534			
21, 500	86, 000	.018000	.001433			
22, 000	88, 000	.019533	.001533			
22, 500	90, 000	.021333	.001800			
23, 000	92, 000	.023000	.001667			
23, 500	94, 000	.025000	.002000			
24, 000	96, 000	.027167	.002167			
24, 500	98, 000	.029700	.002533			
25, 000	100, 000	.032833	.003133			
25, 500	102, 000	.035667	.002834			
26, 000	104, 000	.038500	.002833			
26, 500	106, 000	.042000	.003500			
27, 000	108, 000	.045500	.003500			
27, 500	110, 000	.0500	.0045			
28, 000	112, 000	.0567	.0067			
28, 500	114, 000	.0700	.0133			
29, 000	116, 000	.0900	.0200			
29, 060	116, 240	.1000	.0100			Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	116, 240
Elastic limit per square inch of original section .... do....	60, 000
Elongation per inch after rupture .... inch..	0. 1500
Elongation per inch under strain at elastic limit .... do....	.002233
Reduction in diameter at point of rupture .... do....	.094
Reduction in area after rupture, per centum of original section	30. 6
Position of rupture	1".60 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	".08, ".25*, ".12

No. 3227.

Marks, ${}^{8\ \mathrm{E_1}\ \mathrm{C_4}}_{\mathrm{M\ T,\ M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000200	.000200	0.	....	
2, 500	10, 000	.000367	.000167	0.	....	
3, 750	15, 000	.000533	.000166	0.	....	
5, 000	20, 000	.000700	.000167	0.	....	
6, 250	25, 000	.000867	.000167	0.	....	
7, 500	30, 000	.001067	.000200	0.	....	
8, 750	35, 000	.001233	.000166	0.	....	
10, 000	40, 000	.001400	.000167	0.	....	
11, 250	45, 000	.001600	.000200	....	....	
12, 500	50, 000	.001767	.000167	....	....	
12, 750	51, 000	.001800	.000033	....	....	
13, 000	52, 000	.001867	.000067	....	....	
13, 250	53, 000	.001933	.000066	....	....	
13, 500	54, 000	.002000	.000067	....	....	Elastic limit.
13, 750	55, 000	.002200	.000200	....	....	
14, 000	56, 000	.003000	.000800	....	....	
14, 250	57, 000	.003500	.000500	....	....	
14, 500	58, 000	.004133	.000633	....	....	
14, 750	59, 000	.004567	.000434	....	....	
15, 000	60, 000	.005067	.000500	....	....	
15, 500	62, 000	.006367	.001300	....	....	
16, 000	64, 000	.007500	.001133	....	....	
16, 500	66, 000	.008367	.001067	....	....	
17, 000	68, 000	.009833	.001266	....	....	
17, 500	70, 000	.011133	.001300	....	....	
18, 000	72, 000	.012500	.001367	....	....	
18, 500	74, 000	.013567	.001067	....	....	
19, 000	76, 000	.015000	.001433	....	....	
19, 500	78, 000	.016500	.001500	....	....	
20, 000	80, 000	.018033	.001533	....	....	
20, 500	82, 000	.019700	.001667	....	....	
21, 000	84, 000	.021333	.001633	....	....	
21, 500	86, 000	.023033	.001700	....	....	
22, 000	88, 000	.025033	.002000	....	....	
22, 500	90, 000	.027333	.002300	....	....	
23, 000	92, 000	.030000	.002667	....	....	
23, 500	94, 000	.032500	.002500	....	....	
24, 000	96, 000	.035000	.002500	....	....	
24, 500	98, 000	.038833	.003833	....	....	
25, 000	100, 000	.041667	.002834	....	....	
25, 500	102, 000	.0450	.003333	....	....	
26, 000	104. 000	.0500	.0050	....	....	
26, 500	106, 000	.0567	.0067	....	....	
27, 000	108, 000	.0633	.0066	....	....	
27, 500	110, 000	.0733	.0100	....	....	
28, 000	112, 000	.1000	.0267	....	....	
28, 020	112, 080	.1067	.0067	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 112, 080
Elastic limit per square inch of original section ....do.... 54, 000
Elongation per inch after rupture..inch.. 0. 1600
Elongation per inch under strain at elastic limit ....do.... .002000
Reduction in diameter at point of rupture .. ..do.... .094
Reduction in area after rupture, per centum of original section 30. 6
Position of rupture...1″.55 from neck
Character of broken surface ....granular; silky center
Elongation of inch sections ....″.11, ″.25*, ″.12

No. 3137.

Marks, $\overset{S\ R_1\ C}{B\ T_4\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000567	.000134	—.000033	—.000033	
6,250	25,000	.000700	.000133	—.000033	0.	
7,500	30,000	.000900	.000200	—.000033	0.	
8,750	35,000	.001033	.000133	—.000033	0.	
10,000	40,000	.001200	.000167	—.000033	0.	
11,250	45,000	.001367	.000167	....	....	
12,500	50,000	.001567	.000200	....	....	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001700	.000033	....	....	
13,750	55,000	.001733	.000033	....	....	
14,000	56,000	.001767	.000034	....	....	
14,250	57,000	.001800	.000033	....	....	
14,500	58,000	.001833	.000033	....	....	
14,750	59,000	.001900	.000067	....	....	
15,000	60,000	.001967	.000067	....	....	
15,250	61,000	.002000	.000033	....	....	Elastic limit.
15,500	62,000	.002167	.000167	....	....	
15,750	63,000	.002367	.000200	....	....	
16,000	64,000	.002733	.000366	....	....	
16,250	65,000	.003100	.000367	....	....	
16,500	66,000	.003567	.000467	....	....	
16,750	67,000	.004033	.000466	....	....	
17,000	68,000	.004633	.000600	....	....	
17,250	69,000	.005233	.000600	....	....	
17,500	70,000	.005833	.000600	....	....	
18,000	72,000	.007067	.001234	....	....	
18,500	74,000	.008333	.001266	....	....	
19,000	76,000	.009633	.001300	....	....	
19,500	78,000	.010967	.001334	....	....	
20,000	80,000	.012300	.001333	....	....	
20,500	82,000	.013700	.001400	....	....	
21,000	84,000	.015300	.001600	....	....	
21,500	86,000	.016667	.001367	....	....	
22,000	88,000	.018267	.001600	....	....	
22,500	90,000	.020000	.001733	....	....	
23,000	92,000	.021700	.001700	....	....	
23,500	94,000	.023667	.001967	....	....	
24,000	96,000	.025733	.002066	....	....	
24,500	98,000	.027733	.002000	....	....	
25,000	100,000	.030167	.002434	....	....	
25,500	102,000	.0333	.003133	....	....	
26,000	104,000	.0367	.0034	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0433	.0033	....	....	
27,500	110,000	.0467	.0034	....	....	
28,000	112,000	.0533	.0066	....	....	
28,500	114,000	.0600	.0067	....	....	
29,000	116,000	.0700	.0100	....	....	
29,400	117,600	.0967	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	117,600
Elastic limit per square inch of original section	do ...	61,000
Elongation per inch after rupture	inch..	0.1300
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		39.6
Position of rupture		″.60 from neck
Character of broken surface		granular; dull center
Elongation of inch sections		″.06, ″.06, ″.25

No. 3138.

Marks, $^{8\,R_1\,C_8}_{B\,T_8\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000400	.000200	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000900	.000200	0.	....	
8,750	35,000	.001033	.000133	0.	....	
10,000	40,000	.001233	.000200	0.	....	
11,250	45,000	.001400	.000167	0.	....	
12,500	50,000	.001700	.000300	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001867	.000067	....	....	
13,750	55,000	.001933	.000033	....	....	
14,000	56,000	.002000	.000067	....	....	Elastic limit.
14,250	57,000	.002467	.000467	....	....	
14,500	58,000	.002700	.000233	....	....	
14,750	59,000	.003233	.000533	....	....	
15,000	60,000	.003667	.000434	....	....	
15,250	61,000	.004067	.000400	....	....	
15,500	62,000	.004667	.000600	....	....	
15,750	63,000	.005333	.000666	....	....	
16,000	64,000	.005832	.000500	....	....	
16,250	65,000	.006333	.000500	....	....	
16,500	66,000	.007033	.000700	....	....	
17,000	68,000	.008333	.001300	....	....	
17,500	70,000	.009533	.001200	....	....	
18,000	72,000	.010800	.001267	....	....	
18,500	74,000	.012167	.001367	....	....	
19,000	76,000	.013500	.001333	....	....	
19,500	78,000	.015000	.001500	....	....	
20,000	80,000	.016600	.001600	....	....	
20,500	82,000	.018000	.001400	....	....	
21,000	84,000	.019833	.001833	....	....	
21,500	86,000	.021333	.001500	....	....	
22,000	88,000	.023400	.002067	....	....	
22,500	90,000	.025333	.001933	....	....	
23,000	92,000	.027667	.002334	....	....	
23,500	94,000	.029867	.002200	....	....	
24,000	96,000	.032333	.002466	....	....	
24,500	98,000	.035367	.003034	....	....	
25,000	100,000	.0383	.002933	....	....	
25,500	102,000	.0400	.0017	....	....	
26,000	104,000	.0433	.0033	....	....	
26,500	106,000	.0533	.0100	....	....	
27,000	108,000	.0600	.0067	....	....	
27,500	110,000	.0700	.0100	....	....	
28,000	112,000	.0900	.0200	....	....	
28,100	112,400	.1067	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds... 112,400
Elastic limit per square inch of original section .... do..... 56,000
Elongation per inch after rupture .... inch... 0.1367
Elongation per inch under strain at elastic limit .... do .002000
Reduction in diameter at point of rupture .... do..... .084
Reduction in area after rupture, per centum of original section 27.6
Position of rupture .... 1″.20 from neck
Character of broken surface .... granular; dull spot at circumference
Elongation of inch sections .... ″.20, ″.14 ″.07
Diameter ″.1 from point of rupture .... ″.47

No. 3139.

Marks, $^{S\,R^1\,C_5}_{B\,T_6\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

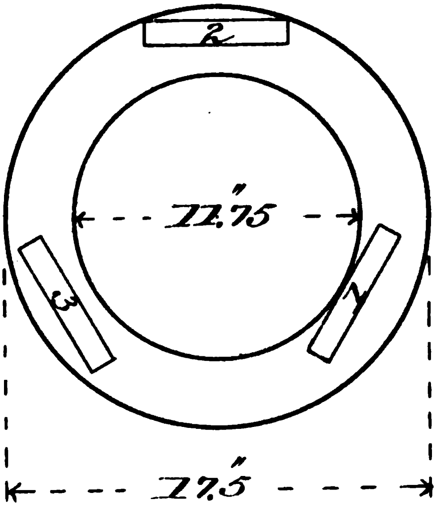
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001367	.000200	.000033	.000033	
11,250	45,000	.001533	.000166	.000033	0.	
11,500	46,000	.001567	.000034	....	....	
11,750	47,000	.001600	.000033	....	....	
12,000	48,000	.001633	.000033	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001700	.000033	....	....	
12,750	51,000	.001733	.000033	....	....	Elastic limit.
13,000	52,000	.001867	.000134	....	....	
13,250	53,000	.002033	.000166	....	....	
13,500	54,000	.003033	.001000	....	....	
13,750	55,000	.003600	.000567	....	....	
14,000	56,000	.004033	.000433	....	....	
14,250	57,000	.004533	.000500	....	....	
14,500	58,000	.005167	.000634	....	....	
14,750	59,000	.005600	.000433	....	....	
15,000	60,000	.006167	.000567	....	....	
15,500	62,000	.007333	.001166	....	....	
16,000	64,000	.008700	.001367	....	....	
16,500	66,000	.009833	.001133	....	....	
17,000	68,000	.011167	.001334	....	....	
17.500	70,000	.012500	.001333	....	....	
18,000	72,000	.013833	.001333	....	....	
18,500	74,000	.015400	.001567	....	....	
19,000	76,000	.016700	.001300	....	....	
19,500	78,000	.018367	.001667	....	....	
20,000	80,000	.020000	.001633	....	....	
20,500	82,000	.021667	.001667	....	....	
21,000	84,000	.023533	.001866	....	....	
21,500	86,000	.025600	.002067	....	....	
22,000	88,000	.027833	.002233	....	....	
22,500	90,000	.030000	.002167	....	....	
23,000	92,000	.032500	.002500	....	....	
23,500	94,000	.035667	.003167	....	....	
24,000	96,000	.0367	.001033	....	....	
24,500	98,000	.0400	.0033	....	....	
25,000	100,000	.0433	.0033	....	....	
25,500	102,000	.0533	.0100	....	....	
26,000	104,000	.0600	.0067	....	....	
26,500	106,000	.0667	.0067	....	....	
27,000	108,000	.0767	.0100	....	....	
27,500	110,000	.1067	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..pounds.. 110,000
Elastic limit per square inch of section ....do.... 51,000
Elongation per inch after rupture ....inch. 0.1633
Elongation per inch under strain at elastic limit ....do.... .001733
Reduction in diameter at point of rupture..do.... .094
Reduction in area after rupture, per centum of original section.. 30.6
Position of rupture ....at middle of stem
Character of broken surface..granular; dull center
Elongation of inch sections ....".10, ".27*, ".12

8 inch Steel B. L. Rifle

Hoop C6



HOOP C₆.

No. 2968.

Marks, $^{8}{}^{B_1}_{T_1}{}^{C_6}_{I}$
Diameter, ″.564.
Section area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001200	.000233	0.	....	
10,000	40,000	.001367	.000167	0.	....	
11,250	45,000	.001567	.000200	....	....	
12,500	50,000	.001733	.000166	....	....	
12,750	51,000	.001767	.000034	....	....	
13,000	52,000	.001833	.000066	....	....	
13,250	53,000	.001867	.000034	....	....	
13,500	54,000	.001900	.000033	....	....	
13,750	55,000	.001933	.000033	....	....	
14,000	56,000	.002000	.000067	....	....	
14,250	57,000	.002033	.000033	....	....	
14,500	58,000	.002067	.000034	....	....	
14,750	59,000	.002133	.000066	....	....	Elastic limit.
15,000	60,000	.003200	.001067	....	....	
15,500	62,000	.008000	.004800	....	....	
16,000	64,000	.009333	.001333	....	....	
16,500	66,000	.010667	.001334	....	....	
17,000	68,000	.012167	.001500	....	....	
17,500	70,000	.013900	.001733	....	....	
18,000	72,000	.015833	.001933	....	....	
18,500	74,000	.018000	.002167	....	....	
19,000	76,000	.019500	.001500	....	....	
19,500	78,000	.021400	.001900	....	....	
20,000	80,000	.023500	.002100	....	....	
20,500	82,000	.026000	.002500	....	....	
21,000	84,000	.028333	.002333	....	....	
21,500	86,000	.031000	.002667	....	....	
22,000	88,000	.033900	.002900	....	....	
22,500	90,000	.037400	.003500	....	....	
23,000	92,000	.041367	.003967	....	....	
23,500	94,000	.046067	.004700	....	....	
24,000	96,000	.052000	.005933	....	....	
24,500	98,000	.058933	.006933	....	....	
25,000	100,000	.0733	.014367	....	....	
25,500	102,000	.0933	.0200	....	....	
25,770	103,080	.1267	.0334	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	103,080
Elastic limit per square inch of original section	do	59,000
Elongation per inch after rupture	inch	0.1733
Elongation per inch under strain at elastic limit	do	.002133
Reduction in diameter at point of rupture		.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.28^{4}, ″.12, ″.12

No. 2969.

Marks, $^{S}{}^{R_1\,C_4}_{T_3\,O}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001367	.000200	.000033	.000033	
11, 250	45, 000	.001533	.000166	....	....	
11, 500	46, 000	.001567	.000034	....	....	
11, 750	47, 000	.001633	.000066	....	....	
12, 000	48, 000	.001667	.000034	....	....	
12, 250	49, 000	.001700	.000033	....	....	
12, 500	50, 000	.001767	.000067	....	....	
12, 750	51, 000	.001833	.000066	....	....	
13, 000	52, 000	.001900	.000067	....	....	
13, 250	53, 000	.001933	.000033	....	....	
13. 500	54, 000	.001967	.000034	....	....	
13. 750	55, 000	.002000	.000033	....	....	
14, 000	56, 000	.002033	.000033	....	....	
14, 250	57. 000	.002067	.000034	....	....	
14, 500	58. 000	.002100	.000033	....	....	
14, 750	59, 000	.002167	.000067	....	....	Elastic limit.
15, 000	60, 000	.002333	.000166	....	....	
15, 250	61, 000	.007000	.004667	....	....	
15, 500	62, 000	.009000	.002000	....	....	
16, 000	64, 000	.010667	.001667	....	....	
16, 500	66, 000	.012167	.001500	....	....	
17, 000	68, 000	.013333	.001166	....	....	
17. 500	70, 000	.014900	.001567	....	....	
18, 000	72, 000	.016667	.001767	....	....	
18, 500	74, 000	.018567	.001900	....	....	
19, 000	76, 060	.020333	.001766	....	....	
19, 500	78, 000	.022400	.002067	....	....	
20, 000	80. 000	.024833	.002433	....	....	
20, 500	82, 000	.027000	.002167	....	....	
21, 000	84, 000	.029333	.002323	....	....	
21. 500	86, 000	.032167	.002834	....	....	
22, 000	88, 000	.035000	.002833	....	....	
22, 500	90. 000	.039000	.004000	....	....	
23, 000	92, 000	.043167	.004167	....	....	
23. 500	94, 000	.048000	.004833	....	....	
24, 000	96, 000	.053333	.005333	....	....	
24, 500	98. 000	.0633	.009967	....	....	
25, 000	100, 000	.0700	.0067	....	....	
25, 500	102, 000	.0933	.0233	....	....	
25, 780	103, 120	.1267	.0334	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	103,120
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1767
Elongation per inch under strain at elastic limit	do....	.002167
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1".60 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		".10, ".30*, ".13

No. 2970.

Marks, $^{8\,R_1\,C_8}_{T_8\,M}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001367	.000167	0.	....	
11,250	45,000	.001533	.000166	....	....	
11,500	46,000	.001567	.000034	....	....	
11,750	47,000	.001600	.000033	....	....	
12,000	48,000	.001667	.000067	....	....	
12,250	49,000	.001700	.000033	....	....	
12,500	50,000	.001733	.000033	....	....	
12,750	51,000	.001767	.000034	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001933	.000066	....	....	
14,000	56,000	.001967	.000034	....	....	
14,250	57,000	.002033	.000066	....	....	
14,500	58,000	.002067	.000034	....	....	
14,750	59,000	.002100	.000033	....	....	
15,000	60,000	.002167	.000067	....	....	Elastic limit.
15,250	61,000	.009333	.007166	....	....	
15,500	62,000	.009833	.000500	....	....	
16,000	64,000	.011333	.001500	....	....	
16,500	66,000	.013000	.001667	....	....	
17,000	68,000	.014333	.001333	....	....	
17,500	70,000	.016000	.001667	....	....	
18,000	72,000	.018000	.002000	....	....	
18,500	74,000	.019667	.001667	....	....	
19,000	76,000	.021667	.002000	....	....	
19,500	78,000	.023667	.002000	....	....	
20,000	80,000	.025833	.002166	....	....	
20,500	82,000	.028333	.002500	....	....	
21,000	84,000	.031000	.002667	....	....	
21,500	86,000	.034167	.003167	....	....	
22,000	88,000	.037333	.003166	....	....	
22,500	90,000	.041200	.003867	....	....	
23,000	92,000	.045667	.004467	....	....	
23,500	94,000	.050667	.005000	....	....	
24,000	96,000	.0567	.006033	....	....	
24,500	98,000	.0667	.0100	....	....	
25,000	100,000	.0800	.0133	....	....	
25,460	101,840	.1267	.0467	....	....	Tensile strength.

General summary.

Specific gravity		7.8486
Hardness		20.03
Tensile strength per square inch of original section	pounds	101,840
Elastic limit per square inch of original section	do	60,000
Elongation per inch after rupture	inch	0.1800
Elongation per inch under strain at elastic limit	do	.002167
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		".95 from neck
Character of broken surface		silky
Elongation of inch sections		".09, ".17, ".23

No. 3216.

Marks, $\begin{smallmatrix}8\,R_1\,C_6\\ T_4\,I\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001133	.000133	0.	....	
10,000	40,000	.001267	.000134	—.000033	—.000033	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001567	.000134	....	....	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001700	.000033	....	....	
13,750	55,000	.001733	.000033	....	....	
14,000	56,000	.001800	.000067	....	....	
14,250	57,000	.001867	.000067	....	....	
14,500	58,000	.001933	.000066	....	....	
14,750	59,000	.002000	.000067	....	....	Elastic limit.
15,000	60,000	.002633	.000633	....	....	
15,250	61,000	.003033	.000400	....	....	
15,500	62,000	.003433	.000400	....	....	
16,000	64,000	.004667	.001234	....	....	
16,500	66,000	.005833	.001166	....	....	
17,000	68,000	.007067	.001234	....	....	
17,500	70,000	.008400	.001333	....	....	
18,000	72,000	.009800	.001400	....	....	
18,500	74,000	.011167	.001367	....	....	
19,000	76,000	.013167	.002000	....	....	
19,500	78,000	.014367	.001200	....	....	
20,000	80,000	.015833	.001466	....	....	
20,500	82,000	.017500	.001667	....	....	
21,000	84,000	.019133	.001633	....	....	
21,500	86,000	.021267	.002134	....	....	
22,000	88,000	.023033	.001766	....	....	
22,500	90,000	.025067	.002034	....	....	
23,000	92,000	.027367	.002300	....	....	
23,500	94,000	.029833	.002466	....	....	
24,000	96,000	.032667	.002834	....	....	
24,500	98,000	.035833	.003166	....	....	
25,000	100,000	.039167	.003334	....	....	
25,500	102,000	.042667	.003500	....	....	
26,000	104,000	.047000	.004333	....	....	
26,500	106,000	.0500	.0030	....	....	
27,000	108,000	.0600	.0100	....	....	
27,500	110,000	.0700	.0100	....	....	
28,000	112,000	.1033	.0333	....	....	
28,010	112,040	.1233	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	112,040
Elastic limit per square inch of original section........do....	59,000
Elongation per inch after rupture........inch..	0.1600
Elongation per inch under strain at elastic limit........do....	.002000
Reduction in diameter at point of rupture........do....	.104
Reduction in area after rupture, per centum of original section........	33.5
Position of rupture	1″.25 from neck
Character of broken surface	granular; silky center
Elongation of inch sections........	″.15, ″.35, ″.10

No. 3217.

Marks, $^{8}\begin{smallmatrix}B_1 & C_8\\ T_5 & O\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000167	. 000167	0.	....	
2, 500	10, 000	. 000333	. 000166	0.	....	
3, 750	15, 000	. 000500	. 000167	0.	....	
5, 000	20, 000	. 000667	. 000167	0.	....	
6, 250	25, 000	. 000833	. 000166	0.	....	
7, 500	30, 000	. 001000	. 000167	0.	....	
8, 750	35, 000	. 001200	. 000200	0.	....	
10, 000	40, 000	. 001833	. 000133	0.	....	
11, 250	45, 000	. 001500	. 000167	....	....	
12, 500	50, 000	. 001667	. 000167	....	....	
12, 750	51, 000	. 001700	. 000033	....	....	
13, 000	52, 000	. 001767	. 000067	....	....	
13, 250	53, 000	. 001833	. 000066	....	....	Elastic limit.
13, 500	54, 000	. 001967	. 000134	....	....	
13, 750	55, 000	. 003033	. 001066	....	....	
14, 000	56, 000	. 003733	. 000700	....	....	
14, 250	57, 000	. 004400	. 000667	....	....	
14, 500	58, 000	. 004933	. 000533	....	....	
14, 750	59, 000	. 005400	. 000467	....	....	
15, 000	60, 000	. 006033	. 000633	....	....	
15, 500	62, 000	. 007100	. 001067	....	....	
16, 000	64, 000	. 008500	. 001600	....	....	
16, 500	66, 000	. 009900	. 001400	....	....	
17, 000	68, 000	. 011233	. 001333	....	....	
17, 500	70, 000	. 012733	. 001500	....	....	
18, 000	72, 000	. 014167	. 001434	....	....	
18, 500	74, 000	. 015567	. 001400	....	....	
19, 000	76, 000	. 017400	. 001833	....	....	
19, 500	78, 000	. 019000	. 001600	....	....	
20, 000	80, 000	. 020667	. 001667	....	....	
20, 500	82, 000	. 022667	. 002000	....	....	
21, 000	84, 000	. 024667	. 002000	....	....	
21, 500	86, 000	. 026767	. 002100	....	....	
22, 000	88, 000	. 029200	. 002433	....	....	
22, 500	90, 000	. 032000	. 002800	....	....	
23, 000	92, 000	. 034667	. 002667	....	....	
23, 500	94, 000	. 037833	. 003166	....	....	
24, 000	96, 000	. 041500	. 003667	....	....	
24, 500	98, 000	. 045400	. 003900	....	....	
25, 000	100, 000	. 0500	. 0046	....	....	
25, 500	102, 000	. 0533	. 0033	....	....	
26, 000	104, 000	. 0633	. 0100	....	....	
26, 500	106, 000	. 0767	. 0134	....	....	
26, 880	107, 520	. 1067	. 0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	107, 520
Elastic limit per square inch of original section	do....	58, 000
Elongation per inch after rupture	inch..	0. 1600
Elongation per inch under strain at elastic limit	do....	. 001833
Reduction in diameter at point of rupture	do....	. 104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		1″.6 from neck
Character of broken surface		silky; interspersed with granular metal at the circumference
Elongation of inch sections		″.10, ″.27*, ″.11

No. 3218.

Marks, $^{\mathrm{S\,R\,C}}_{\mathrm{T\,M}}$
Diameter, ".564.
Sectional area, .25 square inch.

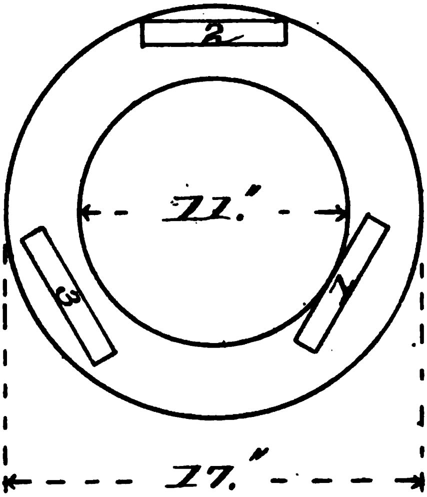
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000300	.000133	0.	....	
3, 750	15, 000	.000500	.000200	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001200	.000200	0.	....	
10, 000	40, 000	.001367	.000167	0.	....	
11, 250	45, 000	.001533	.000166	....	....	
12, 500	50, 000	.001700	.000167	....	....	
12, 750	51, 000	.001733	.000033	....	....	
13, 000	52, 000	.001800	.000067	....	....	
13, 250	53, 000	.001833	.000033	....	....	
13, 500	54, 000	.001900	.000067	....	....	
13, 750	55, 000	.001967	.000067	....	....	Elastic limit.
14, 000	56, 000	.002133	.000166	....	....	
14, 250	57, 000	.002467	.000334	....	....	
14, 500	58, 000	.003200	.000733	....	....	
14, 750	59, 000	.003767	.000567	....	....	
15, 000	60, 000	.004767	.001000	....	....	
15, 500	62, 000	.006033	.001266	....	....	
16, 000	64, 000	.007100	.001067	....	....	
16, 500	66, 000	.008500	.001400	....	....	
17, 000	68, 000	.009667	.001167	....	....	
17, 500	70, 000	.011333	.001666	....	....	
18, 000	72, 000	.012667	.001334	....	....	
18, 500	74, 000	.014333	.001666	....	....	
19, 000	76, 000	.016000	.001667	....	....	
19, 500	78, 000	.017333	.001333	....	....	
20, 000	80, 000	.019000	.001667	....	....	
20, 500	82, 000	.020833	.001833	....	....	
21, 000	84, 000	.022667	.001834	....	....	
21, 500	86, 000	.024367	.001700	....	....	
22, 000	88, 000	.026500	.002133	....	....	
22, 500	90, 000	.029500	.003000	....	....	
23, 000	92, 000	.031667	.002167	....	....	
23, 500	94, 000	.034667	.003000	....	....	
24, 000	96, 000	.037667	.003000	....	....	
24, 500	98, 000	.040667	.003000	....	....	
25, 000	100, 000	.044200	.003533	....	....	
25, 500	102, 000	.0467	.0025	....	....	
26, 000	101, 000	.0567	.0100	....	....	
26, 500	106, 000	.0633	.0066	....	....	
27, 000	108, 000	.0733	.0100	....	....	
27, 360	109, 440	.1067	.0334	....	....	Tensile strength.

General summary.

Specific gravity		7.8609
Hardness		23.03
Tensile strength per square inch of original section	pounds	109, 440
Elastic limit per square inch of original section	do	55, 000
Elongation per inch after rupture	inch	0.1433
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		".80 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".07, ".11, ".25

8 inch steel B. L. Rifle

Hoop C7



H Ex No 16 50, 1.

HOOP C₇.

No. 2892.

Marks, $^{S}{}^{R_1\,C_7}_{T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	.000033	.000033	
8, 750	35, 000	.001167	.000167	.000033	0.	
10, 000	40, 000	.001333	.000166	.000033	0.	
11, 250	45, 000	.001500	.000167	....	....	
11, 500	46, 000	.001533	.000033	....	....	
11, 750	47, 000	.001567	.000034	....	....	
12, 000	48, 000	.001600	.000033	....	....	
12, 250	49, 000	.001633	.000033	....	....	
12, 500	50, 000	.001700	.000067	....	....	
12, 750	51, 000	.001767	.000067	....	....	
13, 000	52, 000	.001800	.000033	....	....	
13, 250	53, 500	.001833	.000033	....	....	
13, 500	54, 000	.001867	.000034	....	....	
13, 750	55, 000	.001900	.000033	....	....	Elastic limit.
14, 000	56, 000	.002000	.000100	....	....	
14, 250	57, 000	.002200	.000200	....	....	
14, 500	58, 000	.002667	.000467	....	....	
14, 750	59, 000	.003167	.000500	....	....	
15, 000	60, 000	.004000	.000833	....	....	
15, 500	62, 000	.007833	.003833	....	....	
16, 000	64, 000	.009500	.001667	....	....	
16, 500	66, 000	.011000	.001500	....	....	
17, 000	68, 000	.012667	.001667	....	....	
17, 500	70, 000	.014200	.001533	....	....	
18, 000	72, 000	.015667	.001467	....	....	
18, 500	74, 000	.017700	.002033	....	....	
19, 000	76, 000	.019667	.001967	....	....	
19, 500	78, 000	.021433	.001766	....	....	
20, 000	80, 000	.023733	.002300	....	....	
20, 500	82, 000	.026000	.002267	....	....	
21, 000	84, 000	.028333	.002333	....	....	
21, 500	86, 000	.031500	.003167	....	....	
22, 000	88, 000	.035000	.003500	....	....	
22, 500	90, 000	.038200	.003200	....	....	
23, 000	92, 000	.042000	.003800	....	....	
23, 500	94, 000	.046000	.004000	....	....	
24, 000	96, 000	.052667	.006667	....	....	
24, 500	98, 000	.060333	.007666	....	....	
25, 000	100, 000	.0733	.012967	....	....	
25, 500	102, 000	.1100	.0367	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102, 000
Elastic limit per square inch of original section	do....	55, 000
Elongation per inch after rupture	inch..	0. 1667
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		⅝″ from neck
Character of broken surface		silky
Elongation of inch sections		″.08, ″.10, ″.32*

No. 2893.

Marks, $^{8}\frac{E, C,}{T, O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
11,500	46,000	.001533	.000033	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001667	.000100	....	....	
12,250	49,000	.001700	.000033	....	....	
12,500	50,000	.001700	0.	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001833	.000033	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001933	.000066	....	....	
14,250	57,000	.002000	.000067	....	....	
14,500	58,000	.002067	.000067	....	....	Elastic limit.
14,750	59,000	.006000	.003933	....	....	
15,000	60,000	.007667	.001667	....	....	
15,500	62,000	.009333	.001666	....	....	
16,000	64,000	.010567	.001234	....	....	
16,500	66,000	.012000	.001433	....	....	
17,000	68,000	.013667	.001667	....	....	
17,500	70,000	.015367	.001700	....	....	
18,000	72,000	.017000	.001633	....	....	
18,500	74,000	.019333	.002333	....	....	
19,000	76,000	.021333	.002000	....	....	
19,500	78,000	.023167	.001834	....	....	
20,000	80,000	.025333	.002166	....	....	
20,500	82,000	.027733	.002400	....	....	
21,000	84,000	.030333	.002600	....	....	
21,500	86,000	.033167	.002834	....	....	
22,000	88,000	.036533	.003366	....	....	
22,500	90,000	.040333	.003800	....	....	
23,000	92,000	.044667	.004334	....	....	
23,500	94,000	.050833	.006166	....	....	
24,000	96,000	.057333	.006500	....	....	
24,500	98,000	.0667	.009367	....	....	
25,000	100,000	.0800	.0133	....	....	
25,410	101,640	.1133	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	101,640
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1867
Elongation per inch under strain at elastic limit	do	.002067
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1″.40 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.23, ″.10

No. 2894.

Marks, $^{8\,R_1\,C_7}_{T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	....	....	
2,500	10,000	.000333	.000166	....	....	
3,750	15,000	.000500	.000167	....	....	
5,000	20,000	.000667	.000167	....	....	
6,250	25,000	.000833	.000166	....	....	
7,500	30,000	.001000	.000167	....	....	
8,750	35,000	.001200	.000200	....	....	
10,000	40,000	.001367	.000167	....	....	
11,250	45,000	.001500	.000133	....	....	
11,500	46,000	.001533	.000033	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001633	.000066	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001700	.000033	....	....	
12,750	51,000	.001767	.000067	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001933	.000066	....	....	
14,000	56,000	.001967	.000034	....	....	
14,250	57,000	.002000	.000033	....	....	Elastic limit.
14,500	58,000	.002100	.000100	....	....	
14,750	59,000	.002333	.000233	....	....	
15,000	60,000	.003100	.000767	....	....	
15,500	62,000	.007933	.004833	....	....	
16,000	64,000	.009333	.001400	....	....	
16,500	66,000	.010500	.001167	....	....	
17,000	68,000	.012000	.001500	....	....	
17,500	70,000	.013400	.001400	....	....	
18,000	72,000	.015000	.001600	....	....	
18,500	74,000	.016900	.001900	....	....	
19,000	76,000	.018833	.001933	....	....	
19,500	78,000	.020400	.001567	....	....	
20,000	80,000	.022400	.002000	....	....	
20,500	82,000	.024433	.002033	....	....	
21,000	84,000	.026667	.002234	....	....	
21,500	86,000	.029500	.002833	....	....	
22,000	88,000	.032333	.002833	....	....	
22,500	90,000	.035000	.002667	....	....	
23,000	92,000	.038333	.003333	....	....	
23,500	94,000	.042167	.003834	....	....	
24,000	96,000	.046667	.004500	....	....	
24,500	98,000	.052500	.005833	....	....	
25,000	100,000	.0633	.0108	....	....	
25,500	102,000	.0733	.0100	....	....	
26,000	104,000	.0900	.0167	....	....	
26,230	104,920	.1183	.0233	....	....	Tensile strength.

General summary.

Specific gravity 7.8461
Hardness 22.02
Tensile strength per square inch of original section..........pounds.. 104,920
Elastic limit per square inch of original section..........do.... 57,000
Elongation per inch after rupture..........inch.. 0.1667
Elongation per inch under strain at elastic limit..........do.... .002000
Reduction in diameter at point of rupture..........do.... .124
Reduction in area after rupture, per centum of original section.......... 39.2
Position of rupture..........″.70 from neck
Character of broken surface..........silky; in part interspersed with fine granulation
Elongation of inch sections..........″.29, ″.11, ″.10

SECOND HOOP C_7.

No. 3219.

Marks, $^{8}\genfrac{}{}{0pt}{}{R_1\ C_7}{T_4\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

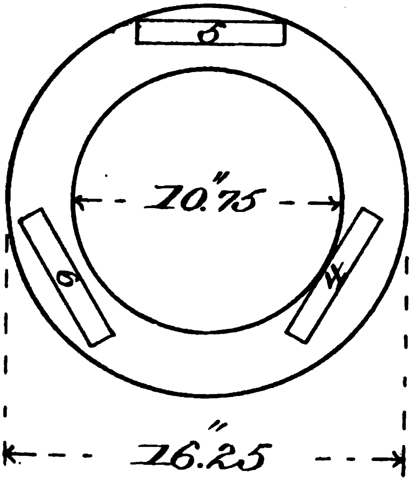
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001533	.000200	....	....	
11,500	50,000	.001700	.000167	....	....	
11,750	51,000	.001733	.000033	....	....	
12,000	52,000	.001800	.000067	....	....	
13,250	53,000	.001867	.000067	....	....	
13,500	54,000	.001933	.000066	....	....	Elastic limit.
13,750	55,000	.002033	.000100	....	....	
14,000	56,000	.002267	.000234	....	....	
14,250	57,000	.002667	.000400	....	....	
14,500	58,000	.003333	.000666	....	....	
14,750	59,000	.003733	.000400	....	....	
15,000	60,000	.004267	.000534	....	....	
15,500	62,000	.005600	.001333	....	....	
16,000	64,000	.006900	.001300	....	....	
16,500	66,000	.008233	.001333	....	....	
17,000	68,000	.009500	.001267	....	....	
17,500	70,000	.010667	.001167	....	....	
18,000	72,000	.012500	.001833	....	....	
18,500	74, 00	.014000	.001500	....	....	
19,000	76,000	.015667	.001667	....	....	
19,500	78,000	.017033	.001366	....	....	
20,000	80,000	.018833	.001800	....	....	
20,500	82,000	.020667	.001834	....	....	
21,000	84,000	.022333	.001666	....	....	
21,500	86,000	.024500	.002167	....	....	
22,000	88,000	.026667	.002167	....	....	
22,500	90,000	.028733	.002066	....	....	
23,000	92,000	.031167	.002434	....	....	
23,500	94,000	.034667	.003500	....	....	
24,000	96,000	.037500	.002833	....	....	
24,500	98,000	.040667	.003167	....	....	
25,000	100,000	.044500	.003833	....	....	
25,500	102,000	.048333	.003833	....	....	
26,000	104,000	.0550	.006667	....	....	
26,500	106,000	.0633	.0083	....	....	
27,000	108,000	.0733	.0100	....	....	
27,420	109,680	.1033	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	109,680
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.1500
Elongation per inch under strain at elastic limit	do	.001933
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.90 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.14, ″.23

8 inch steel B. L. Rifle

Second hoop C 7



No. 3220.

Marks, $\genfrac{}{}{0pt}{}{{}^{8}\mathrm{R}_{4}\,\mathrm{C}_{7}\,'}{\mathrm{T}_{8}\,\mathrm{O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000500	.000200	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001700	.000200	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001800	.000067	....	....	
13,250	53,000	.001867	.000067	....	....	
13,500	54,000	.001933	.000066	....	....	Elastic limit.
13,750	55,000	.002067	.000134	....	....	
14,000	56,000	.002433	.000366	....	....	
14,250	57,000	.002833	.000400	....	....	
14,500	58,000	.003400	.000567	....	....	
14,750	59,000	.003900	.000500	....	....	
15,000	60,000	.004467	.000567	....	....	
15,500	62,000	.005733	.001266	....	....	
16,000	64,000	.007167	.001434	....	....	
16,500	66,000	.008333	.001166	....	....	
17,000	68,000	.009667	.001334	....	....	
17,500	70,000	.011033	.001366	....	....	
18,000	72,000	.012333	.001300	....	....	
18,500	74,000	.014167	.001834	....	....	
19,000	76,000	.016000	.001833	....	....	
19,500	78,000	.017500	.001500	....	....	
20,000	80,000	.019400	.001900	....	....	
20,500	82,000	.021000	.001600	....	....	
21,000	84,000	.022900	.001900	....	....	
21,500	86,000	.024833	.001933	....	....	
22,000	88,000	.027167	.002334	....	....	
22,500	90,000	.029667	.002500	....	....	
23,000	92,000	.031833	.002166	....	....	
23,500	94,000	.034767	.002934	....	....	
24,000	96,000	.038000	.003233	....	....	
24,500	98,000	.041333	.003333	....	....	
25,000	100,000	.045667	.004334	....	....	
25,500	102,000	.048333	.002666	....	....	
26,000	104,000	.0567	.008367	....	....	
26,500	106,000	.0667	.0100	....	....	
27,000	108,000	.0767	.0100	....	....	
27,380	109,520	.1067	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	109,520
Elastic limit per square inch of original section ....do....	54,000
Elongation per inch after rupture ....inch..	0.1633
Elongation per inch under strain at elastic limit ....do....	.001933
Reduction in diameter at point of rupture ....do....	.094
Reduction in area after rupture, per centum of original section	30.6
Position of rupture	1″.40 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.10, ″.25*, ″.14

No. 3221.

Marks, $^{8\,E_1\,C_7}_{T_6\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

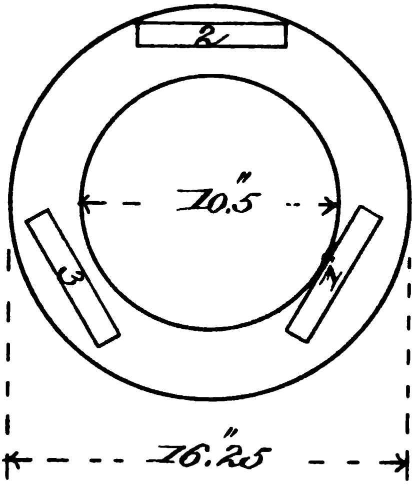
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000833	.000200	0.	....	
7,500	30,000	.001033	.000200	0.	....	
8,750	35,000	.001167	.000134	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001533	.000200	....	....	
12,500	50,000	.001767	.000234	....	....	
12,750	51,000	.001800	.000033	....	....	
13,000	52,000	.001833	.000033	....	....	
13,250	53,000	.001900	.000067	....	....	Elastic limit.
13,500	54,000	.002133	.000233	....	....	
13,750	55,000	.002567	.000434	....	....	
14,000	56,000	.003300	.000733	....	....	
14,250	57,000	.003700	.000400	....	....	
14,500	58,000	.004200	.000500	....	....	
14,750	59,000	.004667	.000467	....	....	
15,000	60,000	.005333	.000666	....	....	
15,500	62,000	.006700	.001367	....	....	
16,000	64,000	.008000	.001300	....	....	
16,500	66,000	.009233	.001233	....	....	
17,000	68,000	.010667	.001434	....	....	
17,500	70,000	.012033	.002366	....	....	
18,000	72,000	.013533	.001500	....	....	
18,500	74,000	.015033	.001500	....	....	
19,000	76,000	.016600	.001567	....	....	
19,500	78,000	.018333	.001733	....	....	
20,000	80,000	.020333	.002000	....	....	
20,500	82,000	.022333	.002000	....	....	
21,000	84,000	.023833	.001500	....	....	
21,500	86,000	.025667	.001834	....	....	
22,000	88,000	.027933	.002266	....	....	
22,500	90,000	.030400	.002467	....	....	
23,000	92,000	.033167	.002767	....	....	
23,500	94,000	.036667	.003500	....	....	
24,000	96,000	.040000	.003333	....	....	
24,500	98,000	.043333	.003333	....	....	
25,000	100,000	.047667	.004334	....	....	
25,500	102,000	.0533	.005633	....	....	
26,000	104,000	.0600	.0067	....	....	
26,500	106,000	.0700	.0100	....	....	
27,000	108,000	.0933	.0233	....	....	
27,100	108,400	.1033	.0100	....	....	Tensile strength.

General summary.

Specific gravity	7.8486
Hardness	21.53
Tensile strength per square inch of original section.....pounds..	108,400
Elastic limit per square inch of original section.....do....	53,000
Elongation per inch after rupture.....inch..	0.1567
Elongation per inch under strain at elastic limit.....do....	.001900
Reduction in diameter at point of rupture.....do....	.094
Reduction in area after rupture, per centum of original section	30.6
Position of rupture	1″.4 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.11, ″.24*, ″.12

8 inch steel B.L. Rifle

Hoop C 8



H Ex No 16 50, 1.

HOOP Co.

No. 2916.

Marks, $^{8}\genfrac{}{}{0pt}{}{R_1\ C_8}{T_1\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001200	.000200	.000033	.000033	
10, 000	40, 000	.001333	.000133	.000033	0.	
11, 250	45, 000	.001500	.000167	....	....	
12, 500	50, 000	.001633	.000133	....	....	
12, 750	51, 000	.001700	.000067	....	....	
13, 000	52, 000	.001767	.000067	....	....	
13, 250	53, 000	.001833	.000066	....	....	
13, 500	54, 000	.001833	0.	....	....	
13, 750	55, 000	.001867	.000034	....	....	Elastic limit.
14, 000	56, 000	.002233	.000366	....	....	
14, 250	57, 000	.003200	.000967	....	....	
14, 500	58, 000	.003900	.000700	....	....	
14, 750	59, 000	.004367	.000467	....	....	
15, 000	60, 000	.005067	.000700	....	....	
15, 500	62, 000	.006433	.001366	....	....	
16, 000	64, 000	.007867	.001434	....	....	
16, 500	66, 000	.009667	.001800	....	....	
17, 000	68, 000	.011000	.001333	....	....	
17, 500	70, 000	.012500	.001500	....	....	
18, 000	72, 000	.014000	.001500	....	....	
18, 500	74, 000	.015833	.001833	....	....	
19, 000	76, 000	.018000	.002167	....	....	
19, 500	78, 000	.019833	.001833	....	....	
20, 000	80, 000	.021533	.001700	....	....	
20, 500	82, 000	.023500	.001967	....	....	
21, 000	84, 000	.026033	.002533	....	....	
21, 500	86, 000	.028333	.002300	....	....	
22, 000	88, 000	.031000	.002667	....	....	
22, 500	90, 000	.034000	.003000	....	....	
23, 000	92, 000	.037333	.003333	....	....	
23, 500	94, 000	.041033	.003700	....	....	
24, 000	96, 000	.044667	.003634	....	....	
24, 500	98, 000	.050000	.005333	....	....	
25, 000	100, 000	.0567	.0067	....	....	
25, 500	102, 000	.0667	.0100	....	....	
26, 000	104, 000	.0800	.0133	....	....	
26, 430	105, 720	.1200	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105, 720
Elastic limit per square inch of original section	do....	55, 000
Elongation per inch after rupture	inch..	0. 1600
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		".55 from neck
Character of broken surface		silky; slightly granular at the circumference
Elongation of inch sections		".28*, ".10, ".10

No. 2917.

Marks, $^{8}\frac{R_1\,C_8}{T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001500	.000167	....	....	
12, 500	50, 000	.001667	.000167	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001733	.000033	....	....	
13, 250	53, 000	.001767	.000034	....	....	
13, 500	54, 000	.001833	.000066	....	....	
13, 750	55, 000	.001867	.000034	....	....	Elastic limit.
14, 000	56, 000	.002000	.000133	....	....	
14, 250	57, 000	.003267	.001267	....	....	
14, 500	58, 000	.004667	.001400	....	....	
14, 750	59, 000	.005433	.000166	....	....	
15, 000	60, 000	.006333	.000900	....	....	
15, 500	62, 000	.007333	.001000	....	....	
16, 000	64, 000	.008500	.001167	....	....	
16, 500	66, 000	.009733	.001233	....	....	
17, 000	68, 000	.011033	.001300	....	....	
17, 500	70, 000	.012500	.001467	....	....	
18, 000	72, 000	.014267	.001767	....	....	
18, 500	74, 000	.016033	.001766	....	....	
19, 000	76, 000	.017233	.001200	....	....	
19, 500	78, 000	.018667	.001434	....	....	
20, 000	80, 000	.020667	.002000	....	....	
20, 500	82, 000	.022400	.001733	....	....	
21, 000	84, 000	.025000	.002600	....	....	
21, 500	86, 000	.026733	.001733	....	....	
22, 000	88, 000	.029333	.002600	....	....	
22, 500	90, 000	.031700	.002367	....	....	
23, 000	92, 000	.035000	.003300	....	....	
23, 500	94, 000	.038000	.003000	....	....	
24, 000	96, 000	.041367	.003367	....	....	
24, 500	98, 000	.045500	.003133	....	....	
25, 000	100, 000	.051333	.005833	....	....	
25, 500	102, 000	.0567	.005367	....	....	
26, 000	104, 000	.0633	.0066	....	....	
26, 500	106, 000	.0767	.0134	....	....	
26, 800	107, 200	.1133	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds..	107, 200
Elastic limit per square inch of original section....................do....	55, 000
Elongation per inch after rupture....................inch..	0. 1600
Elongation per inch under strain at elastic limit....................do....	.001867
Reduction in diameter at point of rupture....................do....	.114
Reduction in area after rupture, per centum of original section....................	36.4
Position of rupture....................	1″.50 from neck
Character of broken surface....................	silky; slightly granular at the circumference
Elongation of inch sections....................	″.12, ″.27″, ″.09

No. 2918.

arks, S B, C T M

iameter, ".564.

ectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000467	.000134	—.000033	—.000033	
5,000	20,000	.000633	.000166	—.000033	0.	
6,250	25,000	.000800	.000167	—.000033	0.	
7,500	30,000	.000967	.000167	—.000033	0.	
8,750	35,000	.001133	.000166	—.000067	—.000034	
10,000	40,000	.001300	.000167	—.000067	0.	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001600	.000133	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001067	.000034	....	....	
13,250	53,000	.001733	.000066	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001867	.000067	....	....	
14,250	57,000	.001900	.000033	....	....	Elastic limit.
14,500	58,000	.004000	.002100	....	....	
14,750	59,000	.004533	.000533	....	....	
15,000	60,000	.005200	.000667	....	....	
15,500	62,000	.006400	.001200	....	....	
16,000	64,000	.007700	.001300	....	....	
16,500	66,000	.009333	.001633	....	....	
17,000	68,000	.010800	.001467	....	....	
17,500	70,000	.012333	.001533	....	....	
18,000	72,000	.014000	.001667	....	....	
18,500	74,000	.016000	.002000	....	....	
19,000	76,000	.017333	.001333	....	....	
19,500	78,000	.019000	.001667	....	....	
20,000	80,000	.021033	.002033	....	....	
20,500	82,000	.023000	.001967	....	....	
21,000	84,000	.024833	.001833	....	....	
21,500	86,000	.027233	.002400	....	....	
22,000	88,000	.029667	.002434	....	....	
22,500	90,000	.032333	.002666	....	....	
23,000	92,000	.035200	.002867	....	....	
23,500	94,000	.039000	.003800	....	....	
24,000	96,000	.043000	.004000	....	....	
24,500	98,000	.047333	.004333	....	....	
25,000	100,000	.052833	.005500	....	....	
25,500	102,000	.0600	.007167	....	....	
26,000	104,000	.0700	.0100	....	....	
26,500	106,000	.0867	.0167	....	....	
26,720	106,880	.1200	.0333	....	....	Tensile strength.

General summary.

Specific gravity		7.84
Hardness		21.
Tensile strength per square inch of original section	pounds..	106, 8
Elastic limit per square inch of original section	do....	57, 0
Elongation per inch after rupture	inch..	0. 16
Elongation per inch under strain at elastic limit	do....	.0019
Reduction in diameter at point of rupture	do....	. 1
Reduction in area after rupture, per centum of original section		41
Position of rupture		".95 from ne
Character of broken surface		silky; granular at circumferen
Elongation of inch sections		".27", ".16, ".

SECOND HOOP C$_8$

No. 3115.

Marks, $^{8\,R_1\,C_8}_{T_4\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

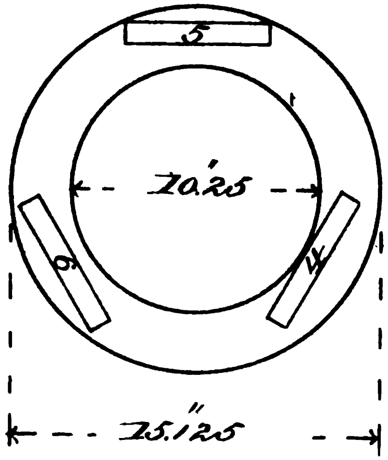
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000167	.000167	0.	....	Initial load.
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000567	.000134	0.	....	
5,000	20,000	.000667	.000100	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001367	.000167	0.	....	
11,250	45,000	.001567	.000200	....	....	
12,500	50,000	.001733	.000166	....	....	
12,750	51,000	.001767	.000034	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001900	.000067	....	....	
13,750	55,000	.001967	.000067	....	....	
14,000	56,000	.002000	.000033	....	....	
14,250	57,000	.002033	.000033	....	....	
14,500	58,000	.002067	.000034	....	....	Elastic limit.
14,750	59,000	.002200	.000133	....	....	
15,000	60,000	.002300	.000100	....	....	
15,250	61,000	.002500	.000200	....	....	
15,500	62,000	.002067	.000167	....	....	
15,750	63,000	.003000	.000333	....	....	
16,000	64,000	.003467	.000467	....	....	
16,500	66,000	.004600	.001133	....	....	
17,000	68,000	.005867	.001267	....	....	
17,500	70,000	.007067	.001200	....	....	
18,000	72,000	.008667	.001600	....	....	
18,500	74,000	.010000	.001333	....	....	
19,000	76,000	.011333	.001333	....	....	
19,500	78,000	.012733	.001400	....	....	
20,000	80,000	.014500	.001767	....	....	
20,500	82,000	.015833	.001333	....	....	
21,000	84,000	.017500	.001667	....	....	
21,500	86,000	.019200	.001700	....	....	
22,000	88,000	.020667	.001467	....	....	
22,500	90,000	.023067	.002400	....	....	
23,000	92,000	.025333	.002266	....	....	
23,500	94,000	.027067	.001734	....	....	
24,000	96,000	.029333	.002266	....	....	
24,500	98,000	.032000	.002667	....	....	
25,000	100,000	.034733	.002733	....	....	
25,500	102,000	.037833	.003100	....	....	
26,000	104,000	.0417	.003867	....	....	
26,500	106,000	.0433	.0016	....	....	
27,000	108,000	.0483	.0050	....	....	
27,500	110,000	.0567	.0084	....	....	
28,000	112,000	.0667	.0100	....	....	
28,500	114,000	.0833	.0166	....	....	
28,620	114,480	.1000	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	114,480
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1267
Elongation per inch under strain at elastic limit	do	.002067
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		".50 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".20*, ".09, ".09

8 inch Steel B. L. Rifle

Second hoop C8



No. 3116.

Marks, $\overset{8\ R_1\ C_6}{T_5\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001567	.000234	....	....	
12, 500	50, 000	.001700	.000033	....	....	
12, 750	51, 000	.001733	.000033	....	....	
13, 000	52, 000	.001833	.000100	....	....	
13, 250	53, 000	.001900	.000067	....	....	Elastic limit.
13, 500	54, 000	.002033	.000133	....	....	
13, 750	55, 000	.002367	.000334	....	....	
14, 000	56, 000	.003067	.000700	....	....	
14, 250	57, 000	.003667	.000600	....	....	
14, 500	58, 000	.004333	.000666	....	....	
14, 750	59, 000	.004767	.000434	....	....	
15, 000	60, 000	.005400	.000633	....	....	
15, 500	62, 000	.006600	.001200	....	....	
16, 000	64, 000	.007667	.001067	....	....	
16, 500	66, 000	.009133	.001466	....	....	
17, 000	68, 000	.010533	.001400	....	....	
17, 500	70, 000	.012067	.001534	....	....	
18, 000	72, 000	.013400	.001333	....	....	
18, 500	74, 000	.015000	.001600	....	....	
19, 000	76, 000	.016467	.001467	....	....	
19, 500	78, 000	.018167	.001700	....	....	
20, 000	80, 000	.020333	.002166	....	....	
20, 500	82, 000	.021833	.001500	....	....	
21, 000	84, 000	.023667	.001834	....	....	
21, 500	86, 000	.025667	.002000	....	....	
22, 000	88, 000	.027833	.002166	....	....	
22, 500	90, 000	.030333	.002500	....	....	
23, 000	92, 000	.033000	.002667	....	....	
23, 500	94, 000	.035933	.002933	....	....	
24, 000	96, 000	.039167	.003234	....	....	
24, 500	98, 000	.0433	.004133	....	....	
25, 000	100, 000	.0467	.0034	....	....	
25, 500	102, 000	.0567	.0100	....	....	
26, 000	104, 000	.0633	.0066	....	....	
26, 500	106, 000	.0700	.0067	....	....	
27, 000	108, 000	.0933	.0233	....	....	
27, 060	108, 240	.1133	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	108, 240
Elastic limit per square inch of original section ....do....	53, 000
Elongation per inch after rupture ....inch..	0. 1533
Elongation per inch under strain at elastic limit..do....	.001900
Reduction in diameter at point of rupture..do....	.104
Reduction in area after rupture, per centum of original section	33. 5
Position of rupture	″.90 from neck
Character of broken surface	granular; silky center
Elongation of inch sections..	″.08, ″.13, ″.25

No. 3117.

Marks, $^{8\,\mathrm{R}_1\mathrm{C}_3}_{\mathrm{T}_3\mathrm{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001700	.000200	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001800	.000067	....	....	Elastic limit.
13,250	53,000	.001933	.000133	....	....	
13,500	54,000	.002400	.000467	....	....	
13,750	55,000	.003167	.000767	....	....	
14,000	56,000	.003733	.000566	....	....	
14,250	57,000	.004167	.000434	....	....	
14,500	58,000	.004733	.000566	....	....	
14,750	59,000	.005300	.000567	....	....	
15,000	60,000	.005567	.000267	....	....	
15,500	62,000	.007200	.001633	....	....	
16,000	64,000	.008567	.001367	....	....	
16,500	66,000	.009867	.001300	....	....	
17,000	68,000	.011267	.001400	....	....	
17,500	70,000	.012833	.001566	....	....	
18,000	72,000	.014200	.001367	....	....	
18,500	74.000	.015733	.001533	....	....	
19,000	76,000	.017233	.001500	....	....	
19,500	78,000	.019033	.001800	....	....	
20,000	80,000	.020733	.001700	....	....	
20,500	82,000	.022733	.002000	....	....	
21,000	84,000	.024667	.001934	....	....	
21,500	86,000	.027100	.002433	....	....	
22,000	88,000	.029167	.002067	....	....	
22,500	90,000	.032067	.002900	....	....	
23,000	92,000	.035000	.002933	....	....	
23,500	94,000	.038167	.003167	....	....	
24,000	96,000	.041167	.003000	....	....	
24,500	98,000	.044667	.003500	....	....	
25,000	100,000	.0500	.005333	....	....	
25,500	102,000	.0600	.0100	....	....	
26,000	104,000	.0667	.0067	....	....	
26,500	106,000	.0733	.0066	....	....	
26,980	107,920	.1100	.0367	....	....	Tensile strength.

General summary.

Specific gravity 7.8492
Hardness 21.89
Tensile strength per square inch of original section ....pounds.. 107,920
Elastic limit per square inch of original section ....do.... 52,000
Elongation per inch after rupture ....inch.. 0.1667
Elongation per inch under strain at elastic limit ....do.... .001800
Reduction in diameter at point of rupture ....do.... .094
Reduction in area after rupture, per centum of original section 30.6
Position of rupture ....1″.55 from neck
Character of broken surface ....granular at circumference; silky center
Elongation of inch sections ....″.12, ″.27*, ″.11

No. 3149.

Marks, $\frac{8\,\mathrm{B,\,C}_8}{\mathrm{T,\,I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000433	.000133	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000800	.000200	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001500	.000200		....	
12, 500	50, 000	.001633	.000133	....	....	
12, 750	51, 000	.001700	.000067	....	....	
13, 000	52, 000	.001767	.000067	....	....	
13, 250	53, 000	.001800	.000033	....	....	
13, 500	54, 000	.001867	.000067	....	....	
13, 750	55, 000	.001900	.000033	....	....	
14, 000	56, 000	.001933	.000033	....	....	
14, 250	57, 000	.001967	.000034	....	....	
14, 500	58, 000	.002000	.000033	....	....	
14, 750	59, 000	.002067	.000067	....	....	Elastic limit.
15, 000	60, 000	.002367	.000300	....	....	
15, 250	61, 000	.002633	.000266	....	....	
15, 500	62, 000	.003067	.000434	....	....	
15, 750	63, 000	.003633	.000566	....	....	
16, 000	64, 000	.004333	.000700	....	....	
16, 500	66, 000	.005400	.001067	....	....	
17, 000	68, 000	.006767	.001367	....	....	
17, 500	70, 000	.008000	.001233	....	....	
18, 000	72, 000	.009167	.001167	....	....	
18, 500	74, 000	.010667	.001500	....	....	
19, 000	76, 000	.012167	.001500	....	....	
19, 500	78, 000	.013667	.001500	....	....	
20, 000	80, 000	.015067	.001400	....	....	
20, 500	82, 000	.016667	.001600	....	....	
21, 000	84, 000	.018333	.001666	....	....	
21, 500	86, 000	.020167	.001834	....	....	
22, 000	88, 000	.022000	.001833	....	....	
22, 500	90, 000	.024000	.002000	....	....	
23, 000	92, 000	.026000	.002000	....	....	
23, 500	94, 000	.028500	.002500	....	....	
24, 000	96, 000	.030333	.001833	....	....	
24, 500	98, 000	.033000	.002667	....	....	
25, 000	100, 000	.036333	.003333	....	....	
25, 500	102, 000	.039667	.003334	....	....	
26, 000	104, 000	.043533	.003866	....	....	
26, 500	106, 000	.0500	.006467	....	....	
27, 000	108, 000	.0567	.0067	....	....	
27, 500	110, 000	.0633	.0066	....	....	
28, 000	112, 000	.0733	.0100	....	....	
28, 320	113, 280	.0967	.0234	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	113, 280
Elastic limit per square inch of original section	do....	59, 000
Elongation per inch after rupture	inch..	0. 1267
Elongation per inch under strain at elastic limit	do....	.002067
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		″.50 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.08, ″.23

No. 3150.

Marks, $^{8}\substack{R,\ C,\\ T,\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000867	.000200	0.	....	
7,500	30,000	.001000	.000133	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001333	.000133	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001700	.000200	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001800	.000067	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001900	.000067	....	....	
13,750	55,000	.001967	.000067	....	....	Elastic limit.
14,000	56,000	.002233	.000266	....	....	
14,250	57,000	.003067	.000834	....	....	
14,500	58,000	.004000	.000933	....	....	
14,750	59,000	.004567	.000567	....	....	
15,000	60,000	.005167	.000600	....	....	
15,500	62,000	.006333	.001166	....	....	
16,000	64,000	.007567	.001234	....	....	
16,500	66,000	.008900	.001333	....	....	
17,000	68,000	.010167	.001267	....	....	
17,500	70,000	.011567	.001400	....	....	
18,000	72,000	.013133	.001566	....	....	
18,500	74,000	.014667	.001534	....	....	
19,000	76,000	.016067	.001400	....	....	
19,500	78,000	.017833	.001766	....	....	
20,000	80,000	.019500	.001667	....	....	
20,500	82,000	.021167	.001667	....	....	
21,000	84,000	.023033	.001866	....	....	
21,500	86,000	.025000	.001967	....	....	
22,000	88,000	.027167	.002167	....	....	
22,500	90,000	.029400	.002233	....	....	
23,000	92,000	.031833	.002433	....	....	
23,500	94,000	.035000	.003167	....	....	
24,000	96,000	.038167	.003167	....	....	
24,500	98,000	.042000	.003833	....	....	
25,000	100,000	.045500	.003500	....	....	
25,500	102,000	.048333	.002833	....	....	
26,000	104,000	.0567	.008367	....	....	
26,500	106,000	.0667	.0100	....	....	
27,000	108,000	.0767	.0100	....	....	
27,340	109,360	.1100	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	109,360
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1633
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		at middle of stem
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		″.10, ″.27*, ″.12

No. 3151.

Marks, $^{8\ R,\ C_8}_{T,\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000533	.000200	0.	....	
5, 000	20, 000	.000733	.000200	0.	....	
6, 250	25, 000	.000867	.000134	0.	....	
7, 500	30, 000	.001033	.000166	0.	....	
8, 750	35, 000	.001200	.000167	0.	....	
10, 000	40, 000	.001400	.000200	.000033	.000033	
11, 250	45, 000	.001533	.000133	....	....	
12, 500	50, 000	.001733	.000200	....	....	
12, 750	51, 000	.001767	.000034	....	....	
13, 000	52, 000	.001800	.000033	....	....	
13, 250	53, 000	.001867	.000067	....	....	
13, 500	54, 000	.001933	.000066	....	....	
13, 750	55, 000	.002000	.000067	....	....	Elastic limit.
14, 000	56, 000	.002633	.000633	....	....	
14, 250	57, 000	.003600	.000967	....	....	
14, 500	58, 000	.004333	.000733	....	....	
14, 750	59, 000	.004833	.000500	....	....	
15, 000	60, 000	.005500	.000667	....	....	
15, 500	62, 000	.006500	.001000	....	....	
16, 000	64, 000	.007733	.001233	....	....	
16, 500	66, 000	.009100	.001367	....	....	
17, 000	68, 000	.010433	.001333	....	....	
17, 500	70, 000	.011833	.001400	....	....	
18, 000	72, 000	.013333	.001500	....	....	
18, 500	74, 000	.014867	.001534	....	....	
19, 000	76, 000	.016167	.001300	....	....	
19, 500	78, 000	.017833	.001666	....	....	
20, 000	80, 000	.019667	.001834	....	....	
20, 500	82, 000	.021333	.001666	....	....	
21, 000	84, 000	.023167	.001834	....	....	
21, 500	86, 000	.025167	.002000	....	....	
22, 000	88, 000	.027500	.002333	....	....	
22, 500	90, 000	.029833	.002333	....	....	
23, 000	92, 000	.032333	.002500	....	....	
23, 500	94, 000	.035333	.003000	....	....	
24, 000	96, 000	.038333	.003000	....	....	
24, 500	98, 000	.041833	.003500	....	....	
25, 000	100, 000	.046000	.004167	....	....	
25, 500	102, 000	.0533	.0073	....	....	
26, 000	104, 000	.0600	.0067	....	....	
26, 500	106, 000	.0667	.0067	....	....	
27, 000	108, 000	.0767	.0100	....	....	
27, 290	109, 160	.1133	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.................................. pounds.. 109, 160
Elastic limit per square inch of original section...do.... 55, 000
Elongation per inch after rupture...inch.. 0. 1633
Elongation per inch under strain at elastic limit..do.... .002000
Reduction in diameter at point of rupture...do.... .094
Reduction in area after rupture, per centum of original section.................................. 30. 6
Position of rupture.. ″.70 from neck
Character of broken surface...granular; silky center
Elongation of inch sections .... ″.25*, ″.12, ″.12

HOOP D_1.

No. 3231.

Marks, $^{8}\frac{E_1\,D_1}{T_1\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

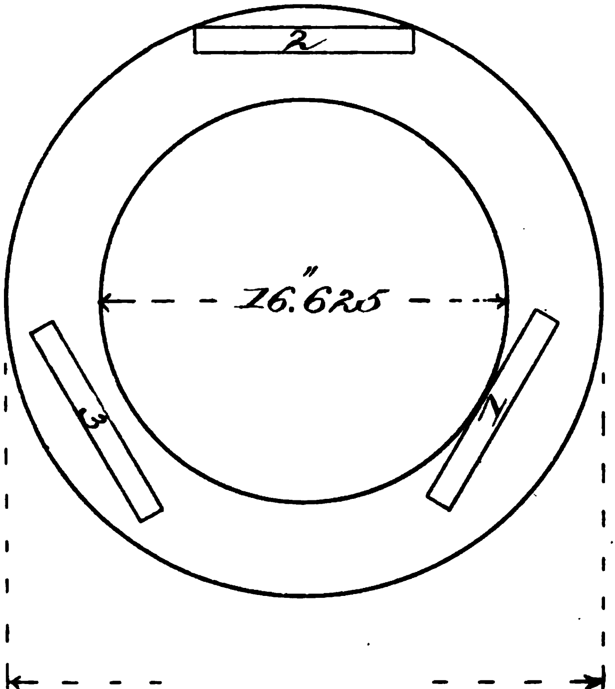
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000283	.000150	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001133	.000183	0.	....	
10,000	40,000	.001333	.000200	.000017	.000017	
11,250	45,000	.001517	.000184	.000033	.000016	
11,500	46,000	.001567	.000050	....	....	
11,750	47,000	.001633	.000066	....	....	Elastic limit.
12,000	48,000	.001867	.000234	....	....	
12,250	49,000	.002183	.000316	....	....	
12,500	50,000	.002500	.000317	....	....	
12,750	51,000	.002800	.000300	....	....	
13,000	52,000	.003133	.000333	....	....	
13,250	53,000	.003600	.000467	....	....	
13,500	54,000	.004067	.000467	....	....	
13,750	55,000	.004583	.000516	....	....	
14,000	56,000	.005267	.000684	....	....	
14,250	57,000	.006000	.000733	....	....	
14,500	58,000	.006683	.000683	....	....	
14,750	59,000	.007500	.000817	....	....	
15,000	60,000	.008167	.000667	....	....	
15,500	62,000	.009933	.001766	....	....	
16,000	64,000	.011583	.001650	....	....	
16,500	66,000	.013167	.001584	....	....	
17,000	68,000	.015200	.002033	....	....	
17,500	70,000	.017333	.002133	....	....	
18,000	72,000	.019167	.001834	....	....	
18,500	74,000	.021417	.002250	....	....	
19,000	76,000	.023833	.002416	....	....	
19,500	78,000	.026500	.001667	....	....	
20,000	80,000	.0300	.0035	....	....	
20,500	82,000	.0333	.0033	....	....	
21,000	84,000	.0367	.0034	....	....	
21,500	86,000	.0417	.0050	....	....	
22,000	88,600	.0450	.0033	....	....	
22,500	90,000	.0517	.0067	....	....	
23,000	92,000	.0600	.0083	....	....	
23,500	94,000	.0667	.0067	....	....	
24,000	96,000	.0817	.0150	....	....	
24,800	97,200	.1117	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....pounds..	97,200
Elastic limit per square inch of original section....do....	47,000
Elongation per inch after rupture....inch..	0.1383
Elongation per inch under strain at elastic limit....do....	.001633
Reduction in diameter at point of rupture....do....	.134
Reduction in area after rupture, per centum of original section....	41.9
Position of rupture....	1".65 from neck
Character of broken surface....	silky; trace of granulation
Elongation of inch sections....	".13, ".35*, ".12, ".09, ".06, ".06

8 inch steel B. L. Rifle

Hoop D 1



H Ex No 16 50, 1.

No. 3232.

Marks, $^{8}{}^{R_1\,D_1}_{T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	.000033	.000033	
10,000	40,000	.001333	.000200	.000033	0.	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001450	.000050	....	....	
11,000	44,000	.001483	.000033	....	....	
11,250	45,000	.001533	.000050	....	....	
11,500	46,000	.001567	.000034	....	....	
11,750	47,000	.001583	.000016	....	....	
12,000	48,000	.001633	.000050	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001700	.000033	....	....	
12,750	51,000	.001733	.000033	....	....	Elastic limit.
13,000	52,000	.001833	.000100	....	....	
13,250	53,000	.001967	.000134	....	....	
13,500	54,000	.002083	.000116	....	....	
13,750	55,000	.002250	.000167	....	....	
14,000	56,000	.002400	.000150	....	....	
14,250	57,000	.002667	.000267	....	....	
14,500	58,000	.002917	.000250	....	....	
14,750	59,000	.003200	.000283	....	....	
15,000	60,000	.003550	.000350	....	....	
15,500	62,000	.004567	.001017	....	....	
16,000	64,000	.005617	.001050	....	....	
16,500	66,000	.006867	.001250	....	....	
17,000	68,000	.008233	.001366	....	....	
17,500	70,000	.009617	.001384	....	....	
18,000	72,000	.011033	.001416	....	....	
18,500	74,000	.012650	.001617	....	....	
19,000	76,000	.014183	.001533	....	....	
19,500	78,000	.015950	.001767	....	....	
20,000	80,000	.017650	.001700	....	....	
20,500	82,000	.019533	.001883	....	....	
21,000	84,000	.021417	.001884	....	....	
21,500	86,000	.023533	.002116	....	....	
22,000	88,000	.025600	.002067	....	....	
22,500	90,000	.0283	.0027	....	....	
23,000	92,000	.0317	.0034	....	....	
23,500	94,000	.0350	.0033	....	....	
24,000	96,000	.0383	.0033	....	....	
24,500	98,000	.0433	.0050	....	....	
25,000	100,000	.0467	.0034	....	....	
25,500	102,000	.0517	.0050	....	....	
26,000	104,000	.0600	.0083	....	....	
26,500	106,000	.0717	.0117	....	....	
26,900	107,600	.0983	.0266	....	....	Tensile strength.

General summary.

Specific gravity		7.8470
Hardness		24.54
Tensile strength per square inch of original section	pounds..	107,600
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1067
Elongation per inch under strain at elastic limit	do....	.001733
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		3″.2 from neck.
Character of broken surface		granular; dull center.
Elongation of inch sections		″.06, ″.06, ″.15, ″.23*, ″.08, ″.06

No. 3233.

Marks, $^{S\,R,\,D,}_{\;T,\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	....	....	
2,500	10,000	.000317	.000167	....	....	
3,750	15,000	.000483	.000166	....	....	
5,000	20,000	.000650	.000167	....	....	
6,250	25,000	.000817	.000167	....	....	
7,500	30,000	.000983	.000166	....	....	
8,750	35,000	.001150	.000167	....	....	
10,000	40,000	.001317	.000167	....	....	
10,250	41,000	.001383	.000066	....	....	
10,500	42,000	.001417	.000034	....	....	
10,750	43,000	.001433	.000016	....	....	
11,000	44,000	.001483	.000050	....	....	
11,250	45,000	.001517	.000034	....	....	
11,500	46,000	.001550	.000033	....	....	
11,750	47,000	.001583	.000033	....	....	
12,000	48,000	.001633	.000050	....	....	Elastic limit.
12,250	49,000	.001717	.000084	....	....	
12,500	50,000	.002183	.000466	....	....	
12,750	51,000	.002567	.000384	....	....	
13,000	52,000	.002917	.000350	....	....	
13,250	53,000	.003317	.000400	....	....	
13,500	54,000	.003733	.000416	....	....	
13,750	55,000	.004217	.000484	....	....	
14,000	56,000	.004800	.000583	....	....	
14,250	57,000	.005417	.000617	....	....	
14,500	58,000	.006050	.000633	....	....	
14,750	59,000	.006683	.000633	....	....	
15,000	60,000	.007433	.000750	....	....	
15,500	62,000	.009083	.001650	....	....	
16,000	64,000	.010517	.001434	....	....	
16,500	66,000	.012150	.001633	....	....	
17,000	68,000	.013783	.001633	....	....	
17,500	70,000	.015600	.001817	....	....	
18,000	72,000	.017550	.001950	....	....	
18,500	74,000	.019350	.001800	....	....	
19,000	76,000	.021767	.002417	....	....	
19,500	78,000	.023750	.001983	....	....	
20,000	80,000	.026517	.002767	....	....	
20,500	82,000	.0317	.005183	....	....	
21,000	84,000	.0333	.0016	....	....	
21,500	86,000	.0367	.0034	....	....	
22,000	88,000	.0400	.0033	....	....	
22,500	90,000	.0467	.0067	....	....	
23,000	92,000	.0500	.0033	....	....	
23,500	94,000	.0550	.0050	....	....	
24,000	96,000	.0650	.0100	....	....	
24,500	98,000	.0783	.0133	....	....	
25,000	100,000	.1000	.0217	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 100,000
Elastic limit per square inch of original section ....do.... 48,000
Elongation per inch after rupture........................inch.. 0.1400
Elongation per inch under strain at elastic limit ....do.... .001633
Reduction in diameter at point of rupture........................do.... .114
Reduction in area after rupture, per centum of original section........................ 36.4
Position of rupture .... 3″.25 from neck
Character of broken surface........................silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections........................ ″.08, ″.11, ″.19, ″.27*, ″.11, ″.08

NEW HOOP D_1.

No. 3459.

Marks, $^{8}\,{}^{R}_{T_4}\,{}^{D_1}_{I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001300	.000150	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	*51,000*	.001667	.000034	....	....	
13,000	*52,000*	.001717	.000050	....	....	
13,250	*53,000*	.001750	.000033	....	....	
13,500	*54,000*	.001783	.000033	....	....	
13,750	*55,000*	.001817	.000034	....	....	
14,000	*56,000*	.001833	.000016	....	....	
14,250	*57,000*	.001883	.000050	....	....	Elastic limit.
14,500	*58,000*	.001950	.000067	....	....	
14,750	*59,000*	.002017	.000067	....	....	
15,000	*60,000*	.002283	.000266	....	....	
15,500	*62,000*	.003467	.000184	....	....	
16,000	*64,000*	.005167	.001700	....	....	
16,500	*66,000*	.006750	.001587	....	....	
17,000	*68,000*	.008117	.001367	....	....	
17,500	*70,000*	.009417	.001300	....	....	
18,000	*72,000*	.010967	.001550	....	....	
18,500	*74,000*	.012167	.001200	....	....	
19,000	*76,000*	.013533	.001366	....	....	
19,500	*78,000*	.015033	.001500	....	....	
20,000	*80,000*	.016750	.001717	....	....	
20,500	*82,000*	.018417	.001667	....	....	
21,000	*84,000*	.019833	.001416	....	....	
21,500	*86,000*	.021667	.001834	....	....	
22,000	*88,000*	.023667	.002000	....	....	
22,500	*90,000*	.025750	.002083	....	....	
23,000	*92,000*	.027017	.002167	....	....	
23,500	*94,000*	.030833	.002916	....	....	
24,000	*96,000*	.033330	.002497	....	....	
24,500	*98,000*	.0367	.003370	....	....	
25,000	*100,000*	.0400	.0033	....	....	
25,500	*102,000*	.0450	.0050	....	....	
26,000	*104,000*	.0517	.0067	....	....	
26,500	*106,000*	.0583	.0066	....	....	
27,000	*108,000*	.0683	.0100	....	....	
27,500	*110,000*	.0867	.0184	....	....	
27,670	*110,680*	.1100	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 110,680
Elastic limit per square inch of original section .... do .. 57,000
Elongation per inch after rupture .... inch.. 0.1533
Elongation per inch under strain at elastic limit ....do.... .001883
Reduction in diameter at point of rupture..do.... .144
Reduction in area after rupture, per centum of original section.. 44.6
Position of rupture..1″.65 from neck
Character of broken surface..silky
Elongation of inch sections..″.13, ″.35*, ″.13, ″.12, ″.10, ″.09

No. 3460.

Marks, $8\frac{R_1 D_1}{T_1 O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000463	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001167	.000184	0.	....	
10,000	40,000	.001317	.000150	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001833	.000050	....	....	
14,000	56,000	.001883	.000050	....	....	Elastic limit.
14,250	57,000	.001967	.000084	....	....	
14,500	58,000	.002100	.000133	....	....	
14,750	59,000	.002333	.000233	....	....	
15,000	60,000	.002750	.000417	....	....	
15,500	62,000	.004000	.001250	....	....	
16,000	64,000	.005333	.001333	....	....	
16,500	66,000	.006783	.001450	....	....	
17,000	68,000	.008250	.001467	....	....	
17,500	70,000	.009500	.001250	....	....	
18,000	72,000	.010917	.001417	....	....	
18,500	74,000	.012383	.001466	....	....	
19,000	76,000	.013800	.001417	....	....	
19,500	78,000	.015250	.001450	....	....	
20,000	80,000	.016867	.001617	....	....	
20,500	82,000	.018533	.001666	....	....	
21,000	84,000	.020283	.001750	....	....	
21,500	86,000	.022333	.002150	....	....	
22,000	88,000	.024133	.001800	....	....	
22,500	90,000	.026333	.002200	....	....	
23,000	92,000	.028667	.002334	....	....	
23,500	94,000	.031250	.002583	....	....	
24,000	96,000	.034083	.002833	....	....	
24,500	98,000	.037167	.003084	....	....	
25,000	100,000	.0433	.006133	....	....	
25,500	102,000	.0483	.0050	....	....	
26,000	104,000	.0517	.0034	....	....	
26,500	106,000	.0617	.0100	....	....	
27,000	108,000	.0733	.0116	....	....	
27,490	109,960	.1050	.0317	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	109,960
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		2" from neck
Character of broken surface		silky center; granular at circumference
Elongation of inch sections		".09, ".11, ".12, ".15, ".30, ".13

No. 3461.

Marks, $^{8\,R_1\,D_1}_{\;\;T_6\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000150	.000150	0.	....	
2, 500	10, 000	.000333	.000183	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.000983	.000150	0.	....	
8, 750	35, 000	.001150	.000167	0.	....	
10, 000	40, 000	.001317	.000167	0.	....	
11, 250	45, 000	.001483	.000166	....	....	
12, 500	50, 000	.001650	.000167	....	....	
12, 750	51, 000	.001683	.000033	....	....	
13, 000	52, 000	.001700	.000017	....	....	
13, 250	53, 000	.001733	.000033	....	....	
13, 500	54, 000	.001783	.000050	....	....	
13, 750	55, 000	.001817	.000034	....	....	
14, 000	56, 000	.001850	.000033	....	....	
14, 250	57, 000	.001900	.000050	....	....	
14, 500	58, 000	.001967	.000067	....	....	
14, 750	59, 000	.002000	.000033	....	....	Elastic limit.
15, 000	60, 000	.002167	.000167	....	....	
15, 250	61, 000	.002450	.000283	....	....	
15, 500	62, 000	.002933	.000483	....	....	
16, 000	64, 000	.004500	.001567	....	....	
16, 500	66, 000	.006250	.001750	....	....	
17, 000	68, 000	.007633	.001383	....	....	
17, 500	70, 000	.009000	.001367	....	....	
18, 000	72, 000	.010333	.001333	....	....	
18, 500	74, 000	.011750	.001417	....	....	
19, 000	76, 000	.013250	.001500	....	....	
19, 500	78, 000	.014600	.001350	....	....	
20, 000	80, 000	.016167	.001567	....	....	
20, 500	82, 000	.017833	.001666	....	....	
21, 000	84, 000	.019583	.001750	....	....	
21, 500	86, 000	.021167	.001684	....	....	
22, 000	88, 000	.023167	.002000	....	....	
22, 500	90, 000	.025333	.002166	....	....	
23, 000	92, 000	.027750	.002417	....	....	
23, 500	94, 000	.030083	.002333	....	....	
24, 000	96, 000	.032917	.002834	....	....	
24, 500	98, 000	.036000	.003083	....	....	
25, 000	100, 000	.039750	.003750	....	....	
25, 500	102, 000	.0433	.003550	....	....	
26, 000	104, 000	.0500	.0067	....	....	
26, 500	106, 000	.0567	.0067	....	....	
27, 000	108, 000	.0667	.0100	....	....	
27, 500	110, 000	.0883	.0216	....	....	
27, 630	110, 520	.1133	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	110, 520
Elastic limit per square inch of original section .... do....	59, 000
Elongation per inch after rupture .... inch..	0. 1667
Elongation per inch under strain at elastic limit .... do	.002000
Reduction in diameter at point of rupture .... do....	.144
Reduction in area after rupture, per centum of original section	44. 6
Position of rupture	2″.20 from neck
Character of broken surface	silky
Elongation of inch sections	″.09, ″.12, ″.16, ″.20, ″32*, ″.11

HOOP D_3.

No. 3146.

Marks, $^{8}{}^{B_1\,D_3}_{T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

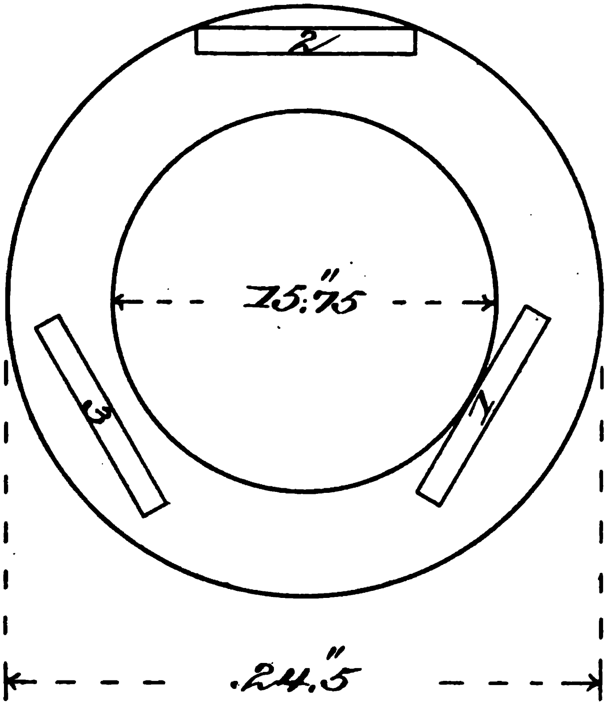
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000967	.000184	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001650	.000183	....	....	Elastic limit.
12,750	51,000	.001733	.000083	....	....	
13,000	52,000	.001867	.000134	....	....	
13,250	53,000	.002000	.000133	....	....	
13,500	54,000	.002167	.000167	....	....	
13,750	55,000	.002367	.000200	....	....	
14,000	56,000	.002667	.000300	....	....	
14,250	57,000	.002917	.000250	....	....	
14,500	58,000	.003200	.000283	....	....	
14,750	59,000	.003500	.000300	....	....	
15,000	60,000	.004000	.000500	....	....	
15,500	62,000	.005083	.001083	....	....	
16,000	64,000	.006333	.001250	....	....	
16,500	66,000	.007750	.001417	....	....	
17,000	68,000	.009083	.001333	....	....	
17,500	70,000	.010333	.001250	....	....	
18,000	72,000	.011750	.001417	....	....	
18,500	74,000	.013167	.001417	....	....	
19,000	76,000	.014750	.001583	....	....	
19,500	78,000	.016417	.001667	....	....	
20,000	80,000	.018000	.001583	....	....	
20,500	82,000	.019833	.001833	....	....	
21,000	84,000	.021750	.001917	....	....	
21,500	86,000	.023833	.002083	....	....	
22,000	88,000	.025833	.002000	....	....	
22,500	90,000	.028250	.002417	....	....	
23,000	92,000	.031083	.002833	....	....	
23,500	94,000	.034000	.002917	....	....	
24,000	96,000	.037083	.003083	....	....	
24,500	98,000	.040667	.003584	....	....	
25,000	100,000	.044417	.003750	....	....	
25,500	102,000	.0500	.005583	....	....	
26,000	104,000	.0567	.0067	....	....	
26,500	106,000	.0650	.0083	....	....	
27,000	108,000	.0800	.0150	....	....	
26,250	109,000	.1000	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 109,000
Elastic limit per square inch of original section....................do.... 50,000
Elongation per inch after rupture....................inch.. 0.1033
Elongation per inch under strain at elastic limit....................do.... .001650
Reduction in diameter at point of rupture....................do... .074
Reduction in area after rupture, per centum of original section.................... 24.6
Position of rupture....................″.55 from neck
Character of broken surface....................granular; dull eccentric spot
Elongation of inch sections....................″.20[a], ″.09, ″.08, ″.08, ″.08, ″.[illegible]

8 inch steel B. L. Rifle

Hoop D 2.



No. 3147.

Marks, $^{8\ B;\ D}_{T;\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000433	.000150	0.	....	
5,000	20,000	.000617	.000184	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001117	.000167	0.	....	
10,000	40,000	.001283	.000166	0.	....	
11,250	45,000	.001467	.000184	....	....	
12,500	50,000	.001700	.000233	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001800	.000067	....	....	
13,250	53,040	.001833	.000033	....	....	
13,500	54,000	.001917	.000084	....	....	
13,750	55,000	.001967	.000050	....	....	Elastic limit.
14,000	56,000	.002117	.000150	....	....	
14,250	57,000	.002250	.000118	....	....	
14,500	58,000	.002367	.000117	....	....	
14,750	59,000	.002533	.000166	....	....	
15,000	60,000	.002750	.000217	....	....	
15,500	62,000	.003333	.000583	....	....	
16,000	64,000	.004100	.000767	....	....	
16,500	66,000	.005083	.000983	....	....	
17,000	68,000	.006300	.001217	....	....	
17,500	70,000	.007583	.001283	....	....	
18,000	72,000	.008767	.001184	....	....	
18,500	74,000	.010333	.001566	....	....	
19,000	76,000	.011667	.001334	....	....	
19,500	78,000	.013250	.001583	....	....	
20,000	80,000	.014833	.001583	....	....	
20,500	82,000	.016500	.001667	....	....	
21,000	84,000	.018200	.001700	....	....	
21,500	86,000	.020000	.001800	....	....	
22,000	88,000	.021833	.001833	....	....	
22,500	90,000	.024017	.002184	....	....	
23,000	92,000	.026250	.002233	....	....	
23,500	94,000	.028667	.002417	....	....	
24,000	96,000	.031333	.002666	....	....	
24,500	98,000	.033750	.002417	....	....	
25,000	100,000	.037000	.003250	....	....	
25,500	102,000	.0433	.0063	....	....	
26,000	104,000	.0483	.0050	....	....	
26,500	106,000	.0517	.0034	....	....	
27,000	108,000	.0567	.0050	....	....	
27,500	110,000	.0667	.0100	....	....	
28,000	112,000	.0850	.0183	....	....	
28,070	112,280	.1017	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 112,280
Elastic limit per square inch of original section ....do.... 55,000
Elongation per inch after rupture ....inch... 0.1200
Elongation per inch under strain at elastic limit....................do.... .001967
Reduction in diameter at point of rupture ....do ... .084
Reduction in area after rupture, per centum of original section 27.6
Position of rupture ....″.3 from neck
Character of broken surface .... granular; silky center
Elongation of inch sections....................″.07, ″.09, ″.13, ″.24*, ″.11, ″.08

No. 3148.

Marks, $^{8\ R,\ D,}_{\ \ T,\ M,}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000300	.000150	0.	....	
3,750	15,000	.000483	.000183	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001333	.000183	0.	....	
11,250	45,000	.001483	.000150	....	....	
11,500	46,000	.001517	.000034	....	....	
11,750	47,000	.001567	.000050	....	....	
12,000	48,000	.001617	.000050	....	....	
12,250	49,000	.001667	.000050	....	....	Elastic limit.
12,500	50,000	.001833	.000166	....	....	
12,750	51,000	.001933	.000100	....	....	
13,000	52,000	.002183	.000250	....	....	
13,250	53,000	.002400	.000217	....	....	
13,500	54,000	.002633	.000233	....	....	
13,750	55,000	.002883	.000250	....	....	
14,000	56,000	.003267	.000384	....	....	
14,250	57,000	.003600	.000333	....	....	
14,500	58,000	.004050	.000450	....	....	
14,750	59,000	.004500	.000450	....	....	
15,000	60,000	.005000	.000500	....	....	
15,500	62,000	.006083	.001083	....	....	
16,000	64,000	.007333	.001250	....	....	
16,500	66,000	.008700	.001367	....	....	
17,000	68,000	.010250	.001550	....	....	
17,500	70,000	.011667	.001417	....	....	
18,000	72,000	.013167	.001500	....	....	
18,500	74,000	.014700	.001533	....	....	
19,000	76,000	.016500	.001800	....	....	
19,500	78,000	.018083	.001583	....	....	
20,000	80,000	.020000	.001917	....	....	
20,500	82,000	.021750	.001750	....	....	
21,000	84,000	.024083	.002333	....	....	
21,500	86,000	.026200	.002117	....	....	
22,000	88,000	.028667	.002467	....	....	
22,500	90,000	.030750	.002083	....	....	
23,000	92,000	.034000	.003250	....	....	
23,500	94,000	.037500	.003500	....	....	
24,000	96,000	.041083	.003583	....	....	
24,500	98,000	.0467	.005617	....	....	
25,000	100,000	.0517	.0050	....	....	
25,500	102,000	.0600	.0083	....	....	
26,000	104,000	.0683	.0083	....	....	
26,500	106,000	.0850	.0167	....	....	
26,690	106,760	.1050	.0200	....	....	Tensile strength.

General summary.

Specific gravity 7.8518
Hardness 23.17
Tensile strength per square inch of original section .... pounds .. 106,760
Elastic limit per square inch of original section .... do 49,000
Elongation per inch after rupture .... inch .. 0.1283
Elongation per inch under strain at elastic limit .... do .... .001667
Reduction in diameter at point of rupture .... do .... .094
Reduction in area after rupture, per centum of original section 30.6
Position of rupture .... 2″.80 from neck
Character of broken surface .... granular; silky center
Elongation of inch sections .... ″.08, ″.10, ″.12, ″.25, ″.12, ″.10

No. 3333.

Marks, $^{8\,\text{R, D,}}_{\quad\text{T}_4\,\text{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000283	.000166	0.	....	
3, 750	15, 000	.000450	.000167	0.	....	
5, 000	20, 000	.000617	.000167	0.	....	
6, 250	25, 000	.000783	.000166	0.	....	
7, 500	30, 000	.000950	.000167	0.	....	
8, 750	35, 000	.001133	.000183	0.	....	
10, 000	40, 000	.001317	.000184	0.	....	
11, 250	45, 000	.001517	.000200	....	....	
11, 500	46, 000	.001550	.000033	....	....	
11, 750	47, 000	.001600	.000050	....	....	Elastic limit.
12, 000	48, 000	.002367	.000767	....	....	
12, 250	49, 000	.002800	.000433	....	....	
12, 500	50, 000	.003000	.000200	....	....	
12, 750	51, 000	.003300	.000300	....	....	
13, 000	52, 000	.003950	.000650	....	....	
13, 250	53, 000	.004500	.000550	....	....	
13, 500	54, 000	.003000	.000500	....	....	
13, 750	55, 000	.005533	.000533	....	....	
14, 000	56, 000	.006333	.000800	....	....	
14, 250	57, 000	.006950	.000617	....	....	
14, 500	58, 000	.007733	.000783	....	....	
14, 750	59, 000	.008367	.000634	....	....	
15, 000	60, 000	.009250	.000883	....	....	
15, 500	62, 000	.011167	.001917	....	....	
16, 000	64, 000	.012750	.001583	....	....	
16, 500	66, 000	.014583	.001833	....	....	
17, 000	68, 000	.016333	.001750	....	....	
17, 500	70, 000	.018250	.001917	....	....	
18, 000	72, 000	.020250	.002000	....	....	
18, 500	74, 000	.022500	.002250	....	....	
19, 000	76, 000	.024583	.002083	....	....	
19, 500	78, 000	.027333	.002750	....	....	
20, 000	80, 000	.029833	.002500	....	....	
20. 500	82, 000	.032667	.002833	....	....	
21, 000	84, 000	.0367	.004033	....	....	
21, 500	86, 000	.0400	.0033	....	....	
22, 000	88, 000	.0450	.0050	....	....	
22, 500	90, 000	.0500	.0050	....	....	
23, 000	92, 000	.0567	.0067	....	....	
23, 500	94, 000	.0667	.0100	....	....	
24, 000	96, 000	.0817	.0150	....	....	
24, 490	97, 960	.1250	.0433	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	97, 960
Elastic limit per square inch of original section	do....	47, 000
Elongation per inch after rupture	inch..	0. 1617
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36. 4
Position of rupture		2″.25 from neck
Character of broken surface		silky
Elongation of inch sections		″.09, ″.28*, ″.20, ″.14, ″.14, ″.12

No. 3334.

Marks, $^{8}{}^{R_1 D_2}_{T_5 O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000283	.000166	0.		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000633	.000183	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000983	.000183	0.		
8,750	35,000	.001150	.000167	0.		
10,000	40,000	.001350	.000200	0.		
11,250	45,000	.001500	.000150			
11,500	46,000	.001533	.000033			
11,750	47,000	.001567	.000034			
12,000	48,000	.001617	.000050			Elastic limit.
12,250	49,000	.001750	.000133			
12,500	50,000	.001967	.000217			
12,750	51,000	.002267	.000300			
13,000	52,000	.002600	.000333			
13,250	53,000	.002867	.000267			
13,500	54,000	.003167	.000300			
13,750	55,000	.003483	.000316			
14,000	56,000	.004017	.000534			
14,250	57,000	.004533	.000516			
14,500	58,000	.005117	.000574			
14,750	59,000	.005833	.000716			
15,000	60,000	.006333	.000500			
15,500	62,000	.007617	.001284			
16,000	64,000	.008917	.001300			
16,500	66,000	.010333	.001416			
17,000	68,000	.011750	.001417			
17,500	70,000	.013417	.001667			
18,000	72,000	.014917	.001500			
18,500	74,000	.016667	.001750			
19,000	76,000	.018250	.001583			
19,500	78,000	.020167	.001917			
20,000	80,000	.0 2333	.002167			
20,500	82,000	.024583	.002250			
21,000	84,000	.026633	.002050			
21,500	86,000	.028917	.002284			
22,000	88,000	.031817	.002900			
22,500	90,000	.0350	.003183			
23,000	92,000	.0383	.0033			
23,500	94,000	.0433	.0050			
24,000	96,000	.0483	.0050			
24,500	98,000	.0517	.0034			
25,000	100,000	.0617	.0100			
25,500	102,000	.0683	.0066			
26,000	104,000	.0883	.0200			
26,110	104,440	.1083	.0200			Tensile strength.

General summary.

Tensile strength per square inch of original section ... pounds..	104,440
Elastic limit per square inch of original section ... do ...	48,000
Elongation per inch after rupture ... inch..	0.1333
Elongation per inch under strain at elastic limit ... do....	.001617
Reduction in diameter at point of rupture ... do....	.094
Reduction in area after rupture, per centum of original section ...	30.6
Position of rupture ...	3″ from neck
Character of broken surface ...	silky, interspersed with granular metal at the circumference
Elongation of inch sections ...	″.10, ″.15, ″.28*, ″.12, ″.08, ″.07

No. 3335.

Marks, $\genfrac{}{}{0pt}{}{{}^{8}R_{1}D_{2}}{T_{6}M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	—.000017	—.000017	
2, 500	10, 000	.000283	.000188	—.000017	0.	
3, 750	15, 000	.000433	.000150	—.000017	0.	
5, 000	20, 000	.000617	.000184	—.000017	0.	
6, 250	25, 000	.000767	.000150	—.000033	—.000016	
7, 500	30, 000	.000933	.000166	—.000033	0.	
8, 750	35, 000	.001117	.000184	—.000033	0.	
10, 000	40, 000	.001283	.000166	—.000033	0.	
11, 250	45, 000	.001450	.000167	....	....	
11, 500	46, 000	.001500	.000050	....	....	
11, 750	47, 000	.001550	.000050	....	....	
12, 000	48, 000	.001600	.000050	....	....	Elastic limit.
12, 250	40, 000	.001683	.000083	....	....	
12, 500	50, 000	.001833	.000150	....	....	
12, 750	51, 000	.002067	.000234	....	....	
13, 000	52, 000	.002300	.000233	....	....	
13, 250	53, 000	.002583	.000283	....	....	
13, 500	54, 000	.002917	.000334	....	....	
13, 750	55, 000	.003200	.000283	....	....	
14, 000	56, 000	.003733	.000533	....	....	
14, 250	57, 000	.004117	.000384	....	....	
14, 500	58, 000	.004667	.000550	....	....	
14, 750	59, 000	.005083	.000416	....	....	
15, 000	60, 000	.005783	.000700	....	....	
15, 500	62, 000	.007083	.001300	....	....	
16, 000	64, 000	.008667	.001584	....	....	
16, 500	66, 000	.010083	.001316	....	....	
17, 000	68, 000	.011533	.001450	....	....	
17, 500	70, 000	.013033	.001500	....	....	
18, 000	72, 000	.014717	.001684	....	....	
18, 500	74, 000	.016367	.001650	....	....	
19, 000	76, 000	.018000	.001633	....	....	
19, 500	78, 000	.019667	.001667	....	....	
20, 000	80, 000	.021583	.001916	....	....	
20, 500	82, 000	.024000	.002417	....	....	
21, 000	84, 000	.026083	.062083	....	....	
31, 500	86, 000	.028750	.002667	....	....	
22, 000	88, 000	.031333	.002583	....	....	
22, 500	90, 000	.0350	.003667	....	....	
23, 000	92, 000	.0383	.0033	....	....	
23, 500	94, 000	.0433	.0050	....	....	
24, 000	96, 000	.0467	.0034	....	....	
24, 500	98, 000	.0533	.0066	....	....	
25, 000	100, 000	.0600	.0067	....	....	
25, 500	102, 000	.0700	.0100	....	....	
25, 820	103, 280	.1067	.0367	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	103, 280
Elastic limit per square inch of original section	do	48, 000
Elongation per inch after rupture	inch	0. 1167
Elongation per inch under strain at elastic limit	do	.001600
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		3″.05 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		″.06, ″.09, ″.27*, ″.14, ″.08, ″.06

NEW HOOP D_2.

No. 3392.

Marks, $^{8}\frac{R_1\,D_2}{T_7\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000150	.000150	0.	....	
2, 500	10, 000	.000333	.000183	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.009166	0.	....	
7, 500	30, 000	.001017	.000184	.000017	,000017	
8, 750	35, 000	.001183	.000166	.000017	0.	
10, 000	40, 000	.001350	.000167	.000017	0.	
11, 250	45, 000	.001550	.000200	....	....	
11, 500	46, 000	.001583	.000033	....	....	
11, 750	47, 000	.001617	.000034	....	....	
12, 000	48, 000	.001650	.000033	....	....	
12, 250	49, 000	.001683	.000033	....	....	
12, 500	50, 000	.001733	.000050	....	....	
12, 750	51, 000	.001767	.000034	....	....	Elastic limit.
13, 000	52, 000	.001850	.000083	....	....	
13, 250	53, 000	.001933	.000083	....	....	
13, 500	54, 000	.002067	.000134	....	....	
13, 750	55, 000	.002333	.000266	....	....	
14, 000	56, 000	.002667	.000334	....	....	
14, 250	57, 000	.002917	.000250	....	....	
14, 500	58, 000	.003300	.000383	....	....	
14, 750	59, 000	.003617	.000317	....	....	
15, 000	60, 000	.003967	.000350	....	....	
15, 500	62, 000	.005000	.001033	....	....	
16, 000	64, 000	.006117	.001117	....	....	
16, 500	66, 000	.007417	.001300	....	....	
17, 000	68, 000	.008917	.001500	....	....	
17, 500	70, 000	.010467	.001550	....	....	
18, 000	72, 000	.011950	.001483	....	....	
18, 500	74, 000	.013750	.001800	....	....	
19, 000	76, 000	.015500	.001750	....	....	
19, 500	78, 000	.017167	.001667	....	....	
20, 000	80, 000	.019000	.001833	....	....	
20, 500	82, 000	.021250	.002250	....	....	
21, 000	84, 000	.023333	.002083	....	....	
21, 500	86, 000	.025500	.002167	....	....	
22, 000	88, 000	.0283	.0028	....	....	
22, 500	90, 000	.0333	.0050	....	....	
23, 000	92, 000	.0367	.0034	....	....	
23, 500	94, 000	.0400	.0033	....	....	
24, 000	96, 000	.0433	.0033	....	....	
24, 500	98, 000	.0483	.0050	....	....	
25, 000	100, 000	.0550	.0067	....	....	
25, 500	102, 000	.0617	.0067	....	....	
26, 000	104, 000	.0767	.0150	....	....	
26, 310	105, 240	.1000	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105, 240
Elastic limit per square inch of original section	do...	51, 000
Elongation per inch after rupture	inch..	0. 1200
Elongation per inch under strain at elastic limit	do...	.001767
Reduction in diameter at point of rupture	do...	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		2″.70 from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		″.07, ″.11, ″.25*, ″.11, ″.10, ″.08

No. 3393.

Marks, $\overset{S\ R_1\ D_3}{T_3\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001333	.000183	0.	....	
11,250	45,000	.001500	.000167	....	....	
11,500	46,000	.001550	.000050	....	....	
11,750	47,000	.001600	.000050	....	....	
12,000	48,000	.001650	.000050	....	....	
12,250	49,000	.001683	.000033	....	....	
12,500	50,000	.001750	.000067	....	....	
12,750	51,000	.001783	.000033	....	....	Elastic limit.
13,000	52,000	.001850	.000067	....	....	
13,250	53,000	.001933	.000083	....	....	
13,500	54,000	.002133	.000200	....	....	
13,750	55,000	.002217	.000084	....	....	
14,000	56,000	.002433	.000216	....	....	
14,250	57,000	.002633	.000200	....	....	
14,500	58,000	.002900	.000267	....	....	
14,750	59,000	.003167	.000267	....	....	
15,000	60,000	.003500	.000333	....	....	
15,500	62,000	.004167	.000667	....	....	
16,000	64,000	.005167	.001000	....	....	
16,500	66,000	.006333	.001166	....	....	
17,000	68,000	.007467	.001134	....	....	
17,500	70,000	.008833	.001366	....	....	
18,000	72,000	.010250	.001417	....	....	
18,500	74,000	.011700	.001450	....	....	
19,000	76,000	.013250	.001550	....	....	
19,500	78,000	.014833	.001583	....	....	
20,000	80,000	.016667	.001834	....	....	
20,500	82,000	.018417	.001650	....	....	
21,000	84,000	.020333	.001916	....	....	
21,500	86,000	.022500	.002167	....	....	
22,000	88,000	.024750	.002250	....	....	
22,500	90,000	.027250	.002500	....	....	
23,000	92,000	.029333	.002083	....	....	
23,500	94,000	.032333	.003000	....	....	
24,000	96,000	.0367	.004367	....	....	
24,500	98,000	.0400	.0033	....	....	
25,000	100,000	.0450	.0050	....	....	
25,500	102,000	.0500	.0050	....	....	
26,000	104,000	.0550	.0050	....	....	
26,500	106,000	.0650	.0100	....	....	
27,000	108,000	.0817	.0167	....	....	
27,070	108,280	.0950	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	108,280
Elastic limit per square inch of original section	do	51,000
Elongation per inch after rupture	inch	0.1117
Elongation per inch under strain at elastic limit	do	.001783
Reduction in diameter at point of rupture	do	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		1″.50 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		″.10, ″.23*, ″.10, ″.09, ″.08, ″.07

No. 3394.

Marks, $\genfrac{}{}{0pt}{}{8\,R_1\,D_3}{T,\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

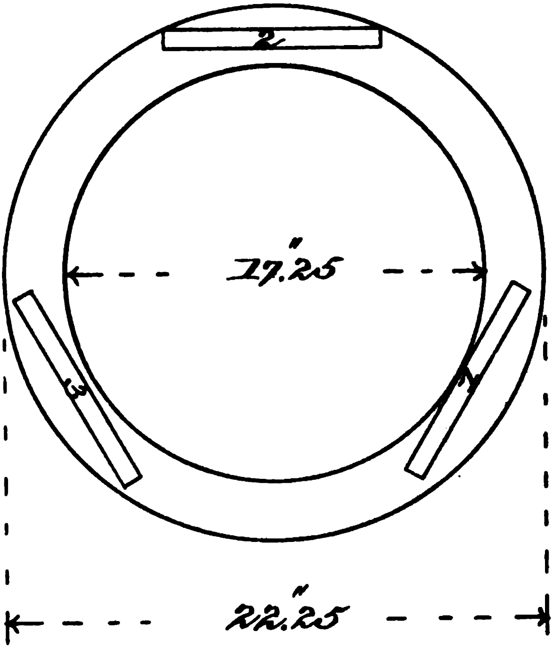
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001017	.000184	0.	....	
8,750	35,000	.001183	.000166	0.	....	
10,000	40,000	.001350	.000167	0.	....	
11,250	45,000	.001517	.000167	....	....	
11,500	46,000	.001567	.000050	....	....	
11,750	47,000	.001617	.000050	....	....	
12,000	48,000	.001650	.000033	....	....	
12,250	49,000	.001683	.000033	....	....	
12,500	50,000	.001750	.000067	....	....	
12,750	51,000	.001783	.000033	....	....	Elastic limit.
13,000	52,000	.001833	.000050	....	....	
13,250	53,000	.001900	.000067	....	....	
13,500	54,000	.002000	.000100	....	....	
13,750	55,000	.002133	.000133	....	....	
14,000	56,000	.002333	.000200	....	....	
14,250	57,000	.002583	.000250	....	....	
14,500	58,000	.003000	.000417	....	....	
14,750	59,000	.003333	.000343	....	....	
15,000	60,000	.003683	.000350	....	....	
15,500	62,000	.004333	.000650	....	....	
16,000	64,000	.005333	.001000	....	....	
16,500	66,000	.016417	.001084	....	....	
17,000	68,000	.007833	.001416	....	....	
17,500	70,000	.009167	.001334	....	....	
18,000	72,000	.010583	.001416	....	....	
18,500	74,000	.011833	.001250	....	....	
19,000	76,000	.013250	.001417	....	....	
19,500	78,000	.015000	.001750	....	....	
20,000	80,000	.016667	.001667	....	....	
20,500	82,000	.018500	.001833	....	....	
21,000	84,000	.020333	.001833	....	....	
21,500	86,000	.022167	.001834	....	....	
22,000	88,000	.024167	.002000	....	....	
22,500	90,000	.026250	.002083	....	....	
23,009	92,000	.028667	.002417	....	....	
23,500	94,000	.0317	.003033	....	....	
24,000	96,000	.0350	.0033	....	....	
24,500	98,000	.0383	.0033	....	....	
25,000	100,000	.0417	.0034	....	....	
25,500	102,000	.0450	.0033	....	....	
26,000	104,000	.0517	.0067	....	....	
26,500	106,000	.0600	.0083	....	....	
27,000	108,000	.0717	.0117	....	....	
27,280	109,120	.0883	.0166	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................pounds.. 109,120
Elastic limit per square inch of original section..................do.... 51,000
Elongation per inch after rupture..................inch.. 0.1000
Elongation per inch under strain at elastic limit..................do.... .001783
Reduction in diameter at point of rupture..................do.... .064
Reduction in area after rupture, per centum of original section.................. 27.6
Position of rupture..................″.65 from neck
Character of broken surface..................granular, silky center
Elongation of inch sections..................″.06, ″.07, ″.07, ″.08, ″.09, ″.23

8 inch steel B. L. Rifle

Hoop D3.



HOOP D_3.

No. 3127.

Marks, $^{8}\,{}^{R_1\,D_3}_{T_1\,I}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001117	.000184	0.	....	
10,000	40,000	.001317	.000200	0.	....	
11,250	45,000	.001483	.000166	....	....	
11,500	46,000	.001517	.000034	....	....	
11,750	47,000	.001567	.000050	....	....	
12,000	48,000	.001600	.000033	....	....	
12,250	49,000	.001650	.000050	....	....	
12,500	50,000	.001683	.000033	....	....	Elastic limit.
12,750	51,000	.001750	.000067	....	....	
13,000	52,000	.001833	.000083	....	....	
13,250	53,000	.001900	.000067	....	....	
13,500	54,000	.001967	.000067	....	....	
13,750	55,000	.002200	.000233	....	....	
14,000	56,000	.002433	.000233	....	....	
14,250	57,000	.002667	.000234	....	....	
14,500	58,000	.002933	.000266	....	....	
14,750	59,000	.003317	.000384	....	....	
15,000	60,000	.003700	.000383	....	....	
15,500	62,000	.004700	.001000	....	....	
16,000	64,000	.005783	.001083	....	....	
16,500	66,000	.006983	.001200	....	....	
17,000	68,000	.008333	.001350	....	....	
17,500	70,000	.009600	.001267	....	....	
18,000	72,000	.011033	.001433	....	....	
18,500	74,000	.012400	.001367	....	....	
19,000	76,000	.013933	.001533	....	....	
19,500	78,000	.015483	.001550	....	....	
20,000	80,000	.017167	.001684	....	....	
20,500	82,000	.019100	.001933	....	....	
21,000	84,000	.020733	.001633	....	....	
21,500	86,000	.022567	.001834	....	....	
22,000	88,000	.024733	.002166	....	....	
22,500	90,000	.027083	.002350	....	....	
23,000	92,000	.0300	.002917	....	....	
23,500	94,000	.0333	.0033	....	....	
24,000	96,000	.0350	.0017	....	....	
24,500	98,000	.0375	.0025	....	....	
25,000	100,000	.0433	.0058	....	....	
25,500	102,000	.0467	.0034	....	....	
26,000	104,000	.0517	.0050	....	....	
26,500	106,000	.0600	.0083	....	....	
27,000	108,000	.0683	.0083	....	....	
27,500	110,000	.0867	.0184	....	....	
27,700	110,800	.1050	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	110,800
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1100
Elongation per inch under strain at elastic limit	do	.001683
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		".50 from neck
Character of broken surface		granular; dull center
Elongation of inch sections		".11, ".08, ".08, ".08, ".09, ".22"

No. 3128.

Marks, $^{8}\substack{R_1 D_3 \\ T_2 O}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000267	.000150	0.	....	
3, 750	15, 000	.000383	.000116	0.	....	
5, 000	20, 000	.000550	.000167	0.	....	
6, 250	25, 000	.000717	.000167	0.	....	
7, 500	30, 000	.000900	.000183	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001250	.000183	0.	....	
11, 250	45, 000	.001417	.000167	....	....	
11, 500	46, 000	.001467	.000050	....	....	
11, 750	47, 000	.001500	.000033	....	....	
12, 000	48. 000	.001550	.000050	....	....	
12, 250	49, 000	.001600	.000050	....	....	
12, 500	50, 000	.001667	.000067	....	....	
12, 750	51, 000	.001750	.000083	....	....	Elastic limit.
13, 000	52. 000	.001917	.000167	....	....	
13, 250	53, 000	.002167	.000250	....	....	
13, 500	54, 000	.002383	.000216	....	....	
13, 750	55, 000	.002700	.000317	....	....	
14, 000	56, 000	.003033	.000333	....	....	
14, 250	57, 000	.003417	.000384	....	....	
14, 500	58, 000	.003833	.000416	....	....	
14, 750	59, 000	.004300	.000467	....	....	
15, 000	60, 000	.004800	.001500	....	....	
15, 500	62, 000	.006033	.001233	....	....	
16, 000	64, 000	.007233	.001200	....	....	
16, 500	66, 000	.008567	.001334	....	....	
17, 000	68, 000	.009967	.001400	....	....	
17, 500	70, 000	.011367	.001400	....	....	
18, 000	72, 000	.012917	.001550	....	....	
18, 500	74, 000	.014433	.001516	....	....	
19, 000	76, 000	.016083	.001640	....	....	
19, 500	78, 000	.017900	.001817	....	....	
20, 000	80, 000	.019700	.001800	....	....	
20, 500	82, 000	.021533	.001833	....	....	
21, 000	84, 000	.023567	.002034	....	....	
21, 500	86, 000	.025700	.002133	....	....	
22, 000	88, 000	.0283	.0026	....	....	
22, 500	90, 000	.0317	.0034	....	....	
23, 000	92, 000	.0350	.0033	....	....	
23, 500	94, 000	.0367	.0017	....	....	
24, 000	96, 000	.0400	.0033	....	....	
24, 500	98, 000	.0467	.0067	....	....	
25, 000	100, 000	.0517	.0050	....	....	
25, 500	102, 000	.0567	.0050	....	....	
26, 000	104, 000	.0667	.0100	....	....	
26, 500	106, 000	.0800	.0133	....	....	
26, 900	107, 600	.1033	.0233	....	....	Tensile strength.

General summary.

Specific gravity		7.8567
Hardness		23.17
Tensile strength per square inch of original section	pounds	107,600
Elastic limit per square inch of original section	do	51,000
Elongation per inch after rupture	inch	0.1233
Elongation per inch under strain at elastic limit	do	.001750
Reduction in diameter at point of rupture	do	.085
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1″.35 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.09, ″.09, ″.11, ″.22*, ″.15

No. 3129.

Marks, $^{8\,R\,D_2}_{T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000183	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001533	.000216	....	....	
11,500	46,000	.001583	.000050	....	....	
11,750	47.000	.001617	.000034	....	....	
12,000	48,000	.001650	.000033	....	....	
12,250	49,000	.001700	.000050	....	....	
12,500	50,000	.001767	.000067	....	....	Elastic limit.
12,750	51,000	.001867	.000100	....	....	
13,000	52,000	.002000	.000133	....	....	
13,250	53,000	.002200	.000200	....	....	
13,500	54,000	.002467	.000267	....	....	
13,750	55,000	.002733	.000266	....	....	
14,000	56,000	.003067	.000334	....	....	
14,250	57,000	.003450	.000383	....	....	
14,500	58,000	.003850	.000400	....	....	
14,750	59,000	.004300	.000450	....	....	
15,000	60,000	.004833	.000533	....	....	
15,500	62,000	.006017	.001184	....	....	
16,000	64,000	.007167	.001150	....	....	
16,500	66,000	.008583	.001416	....	....	
17,000	68,000	.009833	.001250	....	....	
17,500	70,000	.011167	.001334	....	....	
18,000	72,000	.012633	.001466	....	....	
18,500	74,000	.014283	.001650	....	....	
19,000	76,000	.015750	.001467	....	....	
19,500	78,000	.017567	.001817	....	....	
20,000	80,000	.019267	.001700	....	....	
20,500	82,000	.021083	.001816	....	....	
21,000	84,000	.023083	.002000	....	....	
21.500	86,000	.025167	.002084	....	....	
22,000	88,000	.0283	.003133	....	....	
22,500	90,000	.0308	.0025	....	....	
23,000	92,000	.0333	.0025	....	....	
23,500	94,000	.0358	.0025	....	....	
24,000	96,000	.0383	.0025	....	....	
24,500	98,000	.0450	.0067	....	....	
25,000	100,000	.0483	.0033	....	....	
25,500	102,000	.0533	.0050	....	....	
26,000	104,000	.0617	.0084	....	....	
26,500	106,000	.0733	.0116	....	....	
27,000	108,000	.0950	.0217	....	....	
27,100	108,400	.1133	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,400
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1183
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		″.75 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.11, ″.10, ″.08, ″.07, ″.10, ″.25*

No. 3174.

Marks, $^{8}\frac{R_1\,D_3}{T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001717	.000050	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001850	.000050	....	....	Elastic limit.
13,750	55,000	.001917	.000067	....	....	
14,000	56,000	.001983	.000066	....	....	
14,250	57,000	.002050	.000067	....	....	
14,500	58,000	.002150	.000100	....	....	
14,750	59,000	.002300	.000150	....	....	
15,000	60,000	.002500	.000200	....	....	
15,500	62,000	.003000	.000500	....	....	
16,000	64,000	.003667	.000667	....	....	
16,500	66,000	.004500	.000833	....	....	
17,000	68,000	.005417	.000917	....	....	
17,500	70,000	.006583	.001166	....	....	
18,000	72,000	.007833	.001250	....	....	
18,500	74,000	.009167	.001334	....	....	
19,000	76,000	.010583	.001416	....	....	
19,500	78,000	.011917	.001334	....	....	
20,000	80,000	.013300	.001383	....	....	
20,500	82,000	.014833	.001533	....	....	
21,000	84,000	.016417	.001584	....	....	
21,500	86,000	.018167	.001750	....	....	
22,000	88,000	.019833	.001666	....	....	
22,500	90,000	.021667	.001834	....	....	
23,000	92,000	.023750	.002083	....	....	
23,500	94,000	.025833	.002083	....	....	
24,000	96,000	.027967	.002134	....	....	
24,500	98,000	.0317	.003733	....	....	
25,000	100,000	.9350	.0033	....	....	
25,500	102,000	.0383	.0033	....	....	
26,000	104,000	.0417	.0034	....	....	
26,500	106,000	.0450	.0033	....	....	
27,000	108,000	.0500	.0050	....	....	
27,500	110,000	.0550	.0050	....	....	
28,000	112,000	.0633	.0083	....	....	
28,500	114,000	.0800	.0167	....	....	
28,550	114,200	.0867	.0067	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	114,200
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.0883
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.50 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.20*, ″.06, ″.06, ″.06, ″.08, ″.0

No. 3175.

Marks, ${}^{\text{S R, D,}}_{\text{T, O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000450	.000150	0.		
5,000	20,000	.000633	.000183	0.		
6,250	25,000	.000817	.000184	0.		
7,500	30,000	.000983	.000166	0.		
8,750	35,000	.001150	.000167	0.		
10,000	40,000	.001317	.000167	0.		
11,250	45,000	.001500	.000183			
12,500	50,000	.001700	.000200			
12,750	51,000	.001728	.000033			Elastic limit.
13,000	52,000	.001817	.000084			
13,250	53,000	.001917	.000100			
13,500	54,000	.002067	.000150			
13,750	55,000	.002267	.000200			
14,000	56,000	.002533	.000266			
14,250	57,000	.002717	.000184			
14,500	58,000	.003083	.000366			
14,750	59,000	.003350	.000267			
15,000	60,000	.003817	.000467			
15,500	62,000	.004867	.001050			
16,000	64,000	.006000	.001133			
16,500	66,000	.007167	.001167			
17,000	68,000	.008350	.001183			
17,500	70,000	.007750	.001400			
18,000	72,000	.011167	.003417			
18,500	74,000	.012583	.001416			
19,000	76,000	.014100	.001517			
19,500	78,000	.015783	.001683			
20,000	80,000	.017500	.001717			
20,500	82,000	.019283	.001783			
21,000	84,000	.021333	.001950			
21,500	86,000	.023167	.001934			
22,000	88,000	.025200	.002033			
22,500	90,000	.0283	.0031			
23,000	92,000	.0317	.0034			
23,500	94,000	.0350	.0033			
24,000	96,000	.0383	.0033			
24,500	98,000	.0417	.0034			
25,000	100,000	.0450	.0033			
25,500	102,000	.0500	.0050			
26,000	104,000	.0550	.0050			
26,500	106,000	.0683	.0083			
27,000	108,000	.0800	.0167			
27,160	108,640	.0950	.0150			Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 108,640
Elastic limit per square inch of original section..........do.... 51,000
Elongation per inch after rupture..........inch.. 0.1233
Elongation per inch under strain at elastic limit..........do... .001733
Reduction in diameter at point of rupture..........do.... .094
Reduction in area after rupture, per centum of original section.......... 30.6
Position of rupture..........2″ from neck
Character of broken surface..........granular; silky center
Elongation of inch sections..........″.03, ″.25*, ″.16, ″.11, ″.08, ″.06

No. 3176.

Marks, $^{8\,R_1\,D_3}_{\quad T_6\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

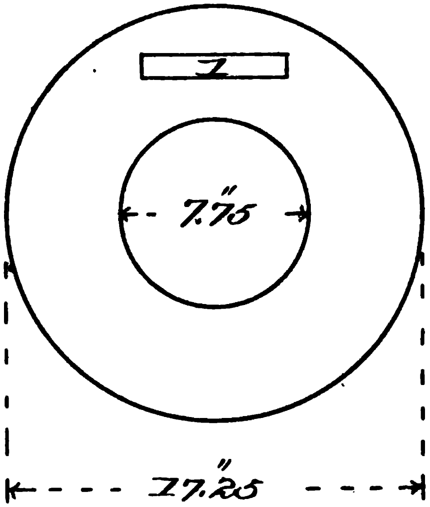
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000333	.000183	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167	0.		
10,000	40,000	.001333	.000166	0.		
11,250	45,000	.001517	.000184			
12,000	48,000	.001667	.000150			
12,250	49,000	.001700	.000033			
12,500	50,000	.001750	.000050			
12,750	51,000	.001800	.000050			
13,000	52,000	.001833	.000033			
13,250	53,000	.001883	.000050			Elastic limit.
13,500	54,000	.002000	.000117			
13,750	55,000	.002117	.000117			
14,000	56,000	.002250	.000133			
14,250	57,000	.002417	.000167			
14,500	58,000	.002633	.000216			
14,750	59,000	.002833	.000200			
15,000	60,000	.003167	.000334			
15,500	62,000	.004000	.000833			
16,000	64,000	.004783	.000783			
16,500	66,000	.005883	.001100			
17,000	68,000	.007250	.001367			
17,500	70,000	.008333	.001083			
18,000	72,000	.009667	.001334			
18,500	74,000	.011333	.001666			
19,000	76,000	.012917	.001584			
19,500	78,000	.014333	.001416			
20,000	80,000	.015750	.001417			
20,500	82,000	.017333	.001583			
21,000	84,000	.019033	.001700			
21,500	86,000	.020833	.001800			
22,000	88,000	.023000	.002167			
22,500	90,000	.024917	.001917			
23,000	92,000	.027000	.002083			
23,500	94,000	.0300	.0030			
24,000	96,000	.0333	.0033			
24,500	98,000	.0367	.0034			
25,000	100,000	.0400	.0033			
25,500	102,000	.0433	.0033			
26,000	104,000	.0483	.0050			
26,500	106,000	.0533	.0050			
27,000	108,000	.0617	.0084			
27,500	110,000	.0717	.0100			
27,930	111,720	.0950	.0233			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,720
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch..	0.1267
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		3″ from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.10, ″.25*, ″.14, ″.10, ″.09

8 inch steel B. L. Rifle

Hoop R1



HOOP R_1.

No. 2919.

Marks, $^{8}{}^{R_1}_{T_1}{}^{R_1}_{M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	—.000033	—.000033	
11,250	45,000	.001467	.000200	....	....	
11,500	46,000	.001500	.000033	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001633	.000033	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001833	.000066	....	....	
14,000	56,000	.001900	.000067	....	....	
14,250	57,000	.001933	.000033	....	....	
14,500	58,000	.001967	.000034	....	....	
14,750	59,000	.002033	.000066	....	....	
15,000	60,000	.002133	.000100	....	....	Elastic limit.
15,250	61,000	.004367	.001234	....	....	
15,500	62,000	.005267	.000900	....	....	
15,750	63,000	.005633	.000366	....	....	
16,000	64,000	.006033	.000100	....	....	
16,500	66,000	.007667	.001634	....	....	
17,000	68,000	.008900	.001233	....	....	
17,500	70,000	.010333	.001433	....	....	
18,000	72,000	.011667	.001334	....	....	
18,500	74,000	.013167	.001500	....	....	
19,000	76,000	.014667	.001500	....	....	
19,500	78,000	.016333	.001666	....	....	
20,000	80,000	.018000	.001667	....	....	
20,500	82,000	.019667	.001667	....	....	
21,000	84,000	.021500	.001833	....	....	
21,500	86,000	.023500	.002000	....	....	
22,000	88,000	.025667	.002167	....	....	
22,500	90,000	.028000	.002333	....	....	
23,000	92,000	.030167	.002167	....	....	
23,500	94,000	.033000	.002833	....	....	
24,000	96,000	.035833	.002833	....	....	
24,500	98,000	.039333	.003500	....	....	
25,000	100,000	.043000	.003667	....	....	
25,500	102,000	.047667	.004667	....	....	
26,000	104,000	.0533	.005633	....	....	
26,500	106,000	.0600	.0067	....	....	
27,000	108,000	.0700	.0100	....	....	
27,500	110,000	.0900	.0200	....	....	
27,590	110,360	.1100	.0200	....	....	Tensile strength.

General summary.

Specific gravity		7.8472
Hardness		23.98
Tensile strength per square inch of original section	pounds..	110,360
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.1600
Elongation per inch under strain at elastic limit	do....	.002133
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1" from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		".10, ".14, ".24*

BREECH BLOCK.

No. 2937.

Marks, $^{S\,B_1\,B\,B}_{\;\,T_1\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

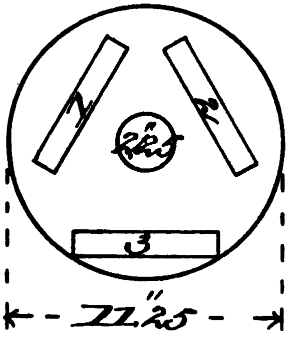
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	....	....	
11,250	45,000	.001567	.000234	....	....	
12,500	50,000	.001733	.000166	....	....	
12,750	51,000	.001800	.000067	....	....	
13,000	52,000	.001833	.000033	....	....	
13,250	53,000	.001867	.000034	....	....	
13,500	54,000	.001933	.000066	....	....	
13,750	55,000	.002000	.000067	....	....	Elastic limit.
14,000	56,000	.003167	.001167	....	....	
14,500	58,000	.004400	.001333	....	....	
15,000	60,000	.006067	.001667	....	....	
15,500	62,000	.007333	.001266	....	....	
16,000	64,000	.009067	.001734	....	....	
16,500	66,000	.010400	.001333	....	....	
17,000	68,000	.012067	.001667	....	....	
17,500	70,000	.013633	.001566	....	....	
18,000	72,000	.015233	.001600	....	....	
18,500	74,000	.017133	.001900	....	....	
19,000	76,000	.019067	.001934	....	....	
19,500	78,000	.020900	.001833	....	....	
20,000	80,000	.022667	.001767	....	....	
20,500	82,000	.024900	.002233	....	....	
21,000	84,000	.027300	.002400	....	....	
21,500	86,000	.029767	.002467	....	....	
22,000	88,000	.032733	.002966	....	....	
22,500	90,000	.036233	.003500	....	....	
23,000	92,000	.039000	.002767	....	....	
23,500	94,000	.0417	.0027	....	....	
24,000	96,000	.0467	.0050	....	....	
24,500	98,000	.0567	.0100	....	....	
25,000	100,000	.0667	.0100	....	....	
25,500	102,000	.0733	.0066	....	....	
26,000	104,000	.0900	.0167	....	....	
26,200	104,800	.1267	.0367	....	....	Tensile strength.

General summary.

Specific gravity		7.8521
Hardness		21.64
Tensile strength per square inch of original section	pounds..	104,800
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1733
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1″.55 from neck
Character of broken surface		silky, 40 per cent.; granular, 60 per cent.
Elongation of inch sections		″.13, ″.27, ″.12

8 inch steel B. L. Rifle

Breech block



No. 2938.

Marks, $^{8\,R_1\,B\,B}_{\quad T_2\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000833	.000200	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001500	.000167	....	....	
11, 500	46, 000	.001567	.000067	....	....	
11, 750	47, 000	.001600	.000033	....	....	
12, 000	48, 000	.001633	.000033	....	....	
12, 250	49, 000	.001667	.000034	....	....	
12, 500	50, 000	.001700	.000033	....	....	
12, 750	51, 000	.001767	.000067	....	....	
13, 000	52, 000	.001800	.000033	....	....	
13, 250	53, 000	.001867	.000067	....	....	
13, 500	54, 000	.001900	.000033	....	....	Elastic limit.
13, 750	55, 000	.002200	.000300	....	....	
14, 000	56, 000	.004700	.002500	....	....	
14, 250	57, 000	.005267	.000567	....	....	
14, 500	58, 000	.005900	.000633	....	....	
14, 750	59, 000	.006400	.000500	....	....	
15, 000	60, 000	.007333	.000933	....	....	
15, 500	62, 000	.009000	.001667	....	....	
16, 000	64, 000	.010400	.001400	....	....	
16, 500	66, 000	.011833	.001433	....	....	
17. 000	68, 000	.013333	.001500	....	....	
17, 500	70, 000	.015067	.001734	....	....	
18, 000	72, 000	.016667	.001600	....	....	
18, 500	74, 000	.018667	.002000	....	....	
19, 000	76, 000	.020833	.002166	....	....	
19, 500	78, 000	.022667	.001834	....	....	
20, 000	80, 000	.024733	.002066	....	....	
20, 500	82, 000	.027333	.002600	....	....	
21, 000	84, 000	.030000	.002667	....	....	
21, 500	86, 000	.032833	.002833	....	....	
22, 000	88, 000	.035000	.002167	....	....	
22, 500	90, 000	.038667	.003667	....	....	
23, 000	92, 000	.0417	.003033	....	....	
23, 500	94, 000	.0467	.0050	....	....	
24, 000	96, 000	.0533	.0066	....	....	
24, 500	98, 000	.0633	.0100	....	....	
25, 000	100, 000	.0700	.0067	....	....	
25, 500	102, 000	.0900	.0200	....	....	
25, 810	103, 240	.1233	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	103, 240
Elastic limit per square inch of original section	do....	54, 000
Elongation per inch after rupture	inch..	0. 1767
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do . .	.104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		1″.50 from neck
Character of broken surface		silky; interspersed with fine granular metal
Elongation of inch sections		″.15, ″.26+, ″.12

No. 2939.

Marks, $^{8\,\mathrm{B_1\,B\,B}}_{\mathrm{T_3\,O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

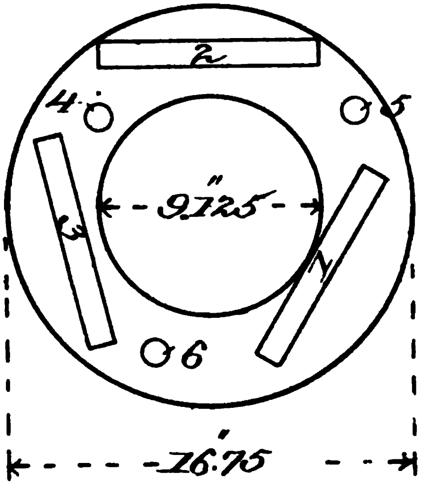
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
11,500	46,000	.001600	.000100	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001667	.000034	....	....	
12,250	49,000	.001700	.000033	....	....	
12,500	50,000	.001767	.000067	....	....	
12,750	51,000	.001800	.000033	....	....	
13,000	52,000	.001833	.000033	....	....	
13,250	53,000	.001867	.000034	....	....	
13,500	54,000	.001933	.000066	....	....	Elastic limit.
13,750	55,000	.002067	.000134	....	....	
14,000	56,000	.004333	.002266	....	....	
14,250	57,000	.004767	.000434	....	....	
14,500	58,000	.005433	.000666	....	....	
14,750	59,000	.006000	.000567	....	....	
15,000	60,000	.006733	.000733	....	....	
15,500	62,000	.008167	.001434	....	....	
16,000	64,000	.009667	.001500	....	....	
16,500	66,000	.011167	.001500	....	....	
17,000	68,000	.012733	.001566	....	....	
17,500	70,000	.014333	.001600	....	....	
18,000	72,000	.016033	.001700	....	....	
18,500	74,000	.017833	.001800	....	....	
19,000	76,000	.019667	.001834	....	....	
19,500	78,000	.021733	.002066	....	....	
20,000	80,000	.024000	.002267	....	....	
20,500	82,000	.026067	.002067	....	....	
21,000	84,000	.028500	.002433	....	....	
21,500	86,000	.031333	.002833	....	....	
22,000	88,000	.034000	.002667	....	....	
22,500	90,000	.037667	.003667	....	....	
23,000	92,000	.041167	.003500	....	....	
23,500	94,000	.045500	.004333	....	....	
24,000	96,000	.050333	.004833	....	....	
24,500	98,000	.0600	.009667	....	....	
25,000	100,000	.0667	.0067	....	....	
25,500	102,000	.0767	.0100	....	....	
26,000	104,000	.1100	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section........pounds..	104,000
Elastic limit per square inch of original section........do ...	54,000
Elongation per inch after rupture........inch..	0.1667
Elongation per inch under strain at elastic limit........do....	.001933
Reduction in diameter at point of rupture........do....	.114
Reduction in area after rupture, per centum of original section........	36.4
Position of rupture........	1″.50 from neck
Character of broken surface........	silky
Elongation of inch sections........	″.14, ″.25*, ″.11

8 inch Steel B. L. Rifle

Bushing ring



H Ex No 16 50, 1.

BUSHING RING.

No. 2945.

Marks, $^{8}\overset{R_1}{T_1}\overset{Bu}{I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000183	0.	....	
2,500	10,000	.000317	.000134	0.	....	
3,750	15,000	.000467	.000150	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001467	.000150	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001750	.000050	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001817	.000034	....	....	
14,000	56,000	.001833	.000016	....	....	
14,250	57,000	.001867	.000034	....	....	
14,500	58,000	.001900	.000033	....	....	
14,750	59,000	.001950	.000050	....	....	Elastic limit.
15,000	60,000	.002283	.000333	....	....	
15,250	61,000	.002633	.000350	....	....	
15,500	62,000	.002850	.000217	....	....	
15,750	63,000	.003533	.000683	....	....	
16,000	64,000	.004600	.001067	....	....	
16,500	66,000	.007500	.002900	....	....	
17,000	68,000	.009500	.002000	....	....	
17,500	70,000	.011250	.001750	....	....	
18,000	72,000	.012500	.001250	....	....	
18,500	74,000	.014083	.001583	....	....	
19,000	76,000	.015600	.001517	....	....	
19,500	78,000	.017333	.001733	....	....	
20,000	80,000	.018967	.001634	....	....	
20,500	82,000	.020917	.001950	....	....	
21,000	84,000	.022833	.001916	....	....	
21,500	86,000	.025000	.002167	....	....	
22,000	88,000	.027250	.002250	....	....	
22,500	90,000	.029833	.002583	....	....	
23,000	92,000	.032500	.002667	....	....	
23,500	94,000	.0367	.0042	....	....	
24,000	96,000	.0400	.0033	....	....	
24,500	98,000	.0450	.0050	....	....	
25,000	100,000	.0500	.0050	....	....	
25,500	102,000	.0567	.0067	....	....	
26,000	104,000	.0650	.0083	....	....	
26,500	106,000	.0800	.0150	....	....	
26,900	107,600	.1050	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	107,600
Elastic limit per square inch of original section	do ...	59,000
Elongation per inch after rupture	inch..	0.1167
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		".55 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		".28*, ".10, ".09. ".07, ".08, ".08

No. 2946.

Marks, $\frac{8\,R_1\,Bu}{T_2\,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000317	.000167	0.		
3,750	15,000	.000483	.000166	0.		
5,000	20,000	.000650	.000167	0.		
6,250	25,000	.000817	.000167	0.		
7,500	30,000	.000983	.000166	0.		
8,750	35,000	.001150	.000167	0.		
10,000	40,000	.001317	.000167	0.		
11,250	45,000	.001467	.000150			
12,500	50,000	.001650	.000183			
12,750	51,000	.001667	.000017			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001783	.000050			
13,750	55,000	.001817	.000034			
14,000	56,000	.001850	.000033			
14,250	57,000	.001883	.000033			
14,500	58,000	.001917	.000034			
14,750	59,000	.001950	.000033			
15,000	60,000	.001983	.000033			
15,250	61,000	.002017	.000034			
15,500	62,000	.002083	.000066			
15,750	63,000	.002150	.000067			Elastic limit.
16,000	64,000	.006500	.003350			
16,500	66,000	.008167	.001667			
17,000	68,000	.009583	.001416			
17,500	70,000	.011067	.001474			
18,000	72,000	.012667	.001600			
18,500	74,000	.014167	.001500			
19,000	76,000	.015783	.001616			
19,500	78,000	.017500	.001717			
20,000	80,000	.019583	.002083			
20,500	82,000	.021333	.001750			
21,000	84,000	.023167	.001834			
21,500	86,000	.025433	.002266			
22,000	88,000	.027833	.002400			
22,500	90,000	.030333	.002500			
23,000	92,000	.0333	.002967			
23,500	94,000	.0367	.0034			
24,000	96,000	.0383	.0016			
24,500	98,000	.0450	.0067			
25,000	100,000	.0500	.0050			
25,500	102,000	.0550	.0050			
26,000	104,000	.0650	.0100			
26,500	106,000	.0817	.0167			
26,740	106,960	.1050	.0233			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	106,960
Elastic limit per square inch of original section	do....	63,000
Elongation per inch after rupture	inch..	0.1450
Elongation per inch under strain at elastic limit	do....	.002150
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2".20 from neck
Character of broken surface		silky
Elongation of inch sections		".08, ".10, ".12, ".20, ".27*, ".10

No. 2947.

Marks, $^{8\,\mathrm{R_1\,Bu}}_{\mathrm{T_2\,M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001883	.000050	....	....	Elastic limit.
14,250	57,000	.002633	.000750	....	....	
14,500	58,000	.003417	.000784	....	....	
14,750	59,000	.004000	.000583	....	....	
15,000	60,000	.004683	.000683	....	....	
15,500	62,000	.006583	.001900	....	....	
16,000	64,000	.009000	.002417	....	....	
16,500	66,000	.010583	.001583	....	....	
17,000	68,000	.011867	.001284	....	....	
17,500	70,000	.013250	.001383	....	....	
18,000	72,000	.014833	.001583	....	....	
18,500	74,000	.016417	.001584	....	....	
19,000	76,000	.018117	.001700	....	....	
19,500	78,000	.019833	.001716	....	....	
20,000	80,000	.021667	.001834	....	....	
20,500	82,000	.023667	.002000	....	....	
21,000	84,000	.025917	.002250	....	....	
21,500	86,000	.028333	.002416	....	....	
22,000	88,000	.030500	.002167	....	....	
22,500	90,000	.0333	.0028	....	....	
23,000	92,000	.0367	.0034	....	....	
23,500	94,000	.0417	.0050	....	....	
24,000	96,000	.0467	.0050	....	....	
24,500	98,000	.0517	.0050	....	....	
25,000	100,000	.0583	.0066	....	....	
25,500	102,000	.0683	.0100	....	....	
26,000	104,000	.0833	.0150	....	....	
26,140	104,560	.0967	.0134	....	....	Tensile strength.

General summary.

Specific gravity		7.8525
Hardness		22.26
Tensile strength per square inch of original section	pounds	104,560
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch	0.1183
Elongation per inch under strain at elastic limit	do	.001883
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.09, ″.07, ″.07, ″.08, ″.11, ″.29[a]

No. 2948.

Marks, $8\,\substack{R_1\,Bn \\ L_4\,I}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	....	....	
10,000	50,000	.001600	.000150	....	....	
10,200	51,000	.001650	.000050	....	....	
10,400	52,000	.001700	.000050	....	....	
10,600	53,000	.001750	.000050	....	....	
10,800	54,000	.001750	0.	....	....	
11,000	55,000	.001800	.000050	....	....	
11,200	56,000	.001850	.000050	....	....	
11,400	57,000	.001900	.000050	....	....	
11,600	58,000	.001950	.000050	....	....	
11,800	59,000	.002000	.000050	....	....	
12,000	60,000	.002050	.000050	....	....	
12,200	61,000	.002050	0.	....	....	
12,400	62,000	.002100	.000050	....	....	
12,600	63,000	.002150	.000050	....	....	Elastic limit.
12,800	64,000	.003150	.001000	....	....	
13,000	65,000	.003700	.000550	....	....	
13,200	66,000	.005000	.001300	....	....	
13,600	68,000	.007500	.002500	....	....	
14,000	70,000	.009000	.001500	....	....	
14,400	72,000	.010350	.001350	....	....	
14,800	74,000	.012000	.001650	....	....	
15,200	76,000	.013500	.001500	....	....	
15,600	78,000	.015250	.001750	....	....	
16,000	80,000	.018250	.003000	....	....	
16,400	82,000	.019000	.000750	....	....	
16,800	84,000	.020600	.001600	....	....	
17,200	86,000	.022500	.001900	....	....	
17,600	88,000	.025000	.002500	....	....	
18,000	90,000	.027050	.002050	....	....	
18,400	92,000	.029500	.002450	....	....	
18,800	94,000	.032250	.002750	....	....	
19,200	96,000	.035350	.003100	....	....	
19,600	98,000	.039500	.004150	....	....	
20,000	100,000	.0425	.0030	....	....	
20,400	102,000	.0500	.0075	....	....	
20,800	104,000	.0550	.0050	....	....	
21,200	106,000	.0650	.0100	....	....	
21,600	108,000	.0800	.0150	....	....	
21,820	109,100	.1100	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	109,100
Elastic limit per square inch of original section	do	63,000
Elongation per inch after rupture	inch	0.1900
Elongation per inch under strain at elastic limit	do	.002150
Reduction in diameter at point of rupture	do	.125
Reduction in area after rupture, per centum of original section		43.3
Position of rupture		¼" from neck
Character of broken surface		fine silky
Elongation of inch sect'ons		".29*, ".09

No. 2949.

Marks, $^{8}{}^{B_1\,Bu}_{L_8\,O}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000400	.000250	0.	....	
3, 000	15, 000	.000550	.000150	0.	....	
4, 000	20, 000	.000700	.000150	0.	....	
5, 000	25, 000	.000850	.000150	0.	....	
6, 000	30, 000	.001000	.000150	0.	....	
7, 000	35, 000	.001200	.000200	0.	....	
8, 000	40, 000	.001350	.000150	0.	....	
9, 000	45, 000	.001550	.000200	....	....	
10, 000	50, 000	.001750	.000200	....	....	
10, 200	51, 000	.001800	.000050	....	....	
10, 400	52, 000	.001850	.000050	....	....	
10, 600	53, 000	.001900	.000050	....	....	
10, 800	54, 000	.001900	0.	....	....	
11, 000	55, 000	.001950	.000050	....	....	
11, 200	56, 000	.002000	.000050	....	....	
11, 400	57, 000	.002050	.000050	....	....	
11, 600	58, 000	.002050	0.	....	....	
11, 800	59, 000	.002100	.000050	....	....	
12, 000	60, 000	.002150	.000050	....	....	
12, 200	61, 000	.002150	0.	....	....	
12, 400	62, 000	.002150	0.	....	....	
12, 600	63, 000	.002200	.000050	....	....	
12, 800	64, 000	.002250	.000050	....	....	
13, 000	65, 000	.002300	.000050	....	....	
13, 200	66, 000	.002300	0.	....	....	
13, 400	67, 000	.002350	.000050	....	....	Elastic limit.
13, 000	68, 000	.004250	.001900	....	....	
13, 800	69, 000	.006000	.001750	....	....	
14, 000	70, 000	.007000	.001000	....	....	
14, 400	72, 000	.008800	.001800	....	....	
14, 800	74, 000	.010500	.001700	....	....	
15, 200	76, 000	.012000	.001500	....	....	
15, 600	78, 000	.013600	.001600	....	....	
16, 000	80, 000	.015500	.001900	....	....	
16, 400	82, 000	.017900	.002400	....	....	
16, 800	84, 000	.019500	.001600	....	....	
17, 200	86, 000	.021350	.001850	....	....	
17, 600	88, 000	.023400	.002050	....	....	
18, 000	90, 000	.025850	.002450	....	....	
18, 400	92, 000	.028350	.002500	....	....	
18, 800	94, 000	.030600	.002250	....	....	
19, 200	96, 000	.034100	.003500	....	....	
19, 600	98, 000	.037600	.003500	....	....	
20, 000	100, 000	.041750	.004150	....	....	
20, 400	102, 000	.047000	.005250	....	....	
20, 800	104, 000	.053500	.006500	....	....	
21, 200	106, 000	.061500	.008000	....	....	
21, 600	108, 000	.0700	.0085	....	....	
22, 000	110, 000	.1050	.0350	....	....	
22, 010	110, 050	....	....	....	....	Tensile strength.

General summary

Tensile strength per square inch of original section	pounds..	110, 050
Elastic limit per square inch of original section	do....	67, 000
Elongation per inch after rupture	inch..	0. 2150
Elongation per inch under strain at elastic limit	do....	.002350
Reduction in diameter at point of rupture	do....	.135
Reduction in area after rupture, per centum of original section		46. 2
Position of rupture		1″ from neck
Character of broken surface		fine silky
Elongation of inch sections		″.29*, ″.14

No. 2950.

Marks, $^{S}\,{}^{R_1}_{Ls}\,{}^{Bn}_{M}$
Diameter, ″.505.
Sectional area, .20 square inch.

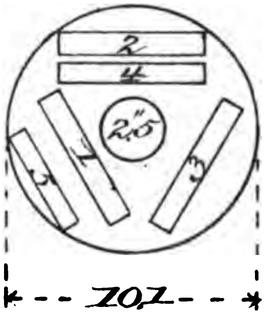
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000700	.000150	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
7,000	35,000	.001150	.000150	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001500	.000200	....	....	
10,000	50,000	.001650	.000150	....	....	
11,000	55,000	.001850	.000200	....	....	
11,200	56,000	.001900	.000050	....	....	
11,400	57,000	.001950	.000050	....	....	Elastic limit.
11,600	58,000	.003900	.001950	....	....	
11,800	59,000	.005200	.001300	....	....	
12,000	60,000	.006150	.000950	....	....	
12,400	62,000	.007800	.001650	....	....	
12,800	64,000	.009700	.001900	....	....	
13,200	66,000	.011150	.001450	....	....	
13,600	68,000	.012300	.001150	....	....	
14,000	70,000	.013900	.001600	....	....	
14,400	72,000	.015500	.001600	....	....	
14,800	74,000	.017000	.001500	....	....	
15,200	76,000	.019000	.002000	....	....	
15,600	78,000	.020750	.001750	....	....	
16,000	80,000	.022700	.001950	....	....	
16,400	82,000	.025150	.002450	....	....	
16,800	84,000	.027300	.002150	....	....	
17,200	86,000	.029550	.002250	....	....	
17,600	88,000	.032700	.003150	....	....	
18,000	90,000	.035500	.002800	....	....	
18,400	92,000	.039850	.004350	....	....	
18,800	94,000	.044500	.004650	....	....	
19,200	96,000	.049000	.004500	....	....	
19,600	98,000	.055000	.006000	....	....	
20,000	100,000	.0600	.0050	....	....	
20,400	102,000	.0700	.0100	....	....	
20,800	104,000	.1000	.0300	....	....	
20,910	104,550	.1250	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 104,550
Elastic limit per square inch of original section..........do ... 57,000
Elongation per inch after rupture..........inch.. 0.2300
Elongation per inch under strain at elastic limit..........do ... .001950
Reduction in diameter at point of rupture..........do.... .125
Reduction in area after rupture, per centum of original section.......... ... 43.3
Position of rupture..........″.90 from neck
Character of broken surface..........fine silky
Elongation of inch sections..........″.30*, ″.16

8 inch steel B. L. Rifle

Gas check ring



H Ex No 16 50, 1.

GAS-CHECK RING.

No. 2846.

Marks $^{8}R_{1}\,\genfrac{}{}{0pt}{}{G\;R}{T_{1}\;I}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
10,000	40,000	.001300	.000167	....	....	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001433	.000066	....	....	
11,000	44,000	.001467	.000034	....	....	
11,250	45,000	.001500	.000033	....	....	
11,500	46,000	.001533	.000033	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001600	.000033	....	....	
12,250	49,000	.001633	.000033	....	....	Elastic limit.
12,500	50,000	.001767	.000134	....	....	
12,750	51,000	.001867	.000100	....	....	
13,000	52,000	.001967	.000100	....	....	
13,250	53,000	.002167	.000200	....	....	
13,500	54,000	.002633	.000466	....	....	
13,750	55,000	.003167	.000534	....	....	
14,000	56,000	.003900	.000733	....	....	
14,500	58,000	.005367	.001467	....	....	
15,000	60,000	.007067	.001700	....	....	
15,500	62,000	.008667	.001600	....	....	
16,000	64,000	.010367	.001700	....	....	
16,500	66,000	.012167	.001800	....	....	
17,000	68,000	.014067	.001900	....	....	
17,500	70,000	.015933	.001866	....	....	
18,000	72,000	.017667	.001734	....	....	
18,500	74,000	.019667	.002000	....	....	
19,000	76,000	.021667	.002000	....	....	
19,500	78,000	.024000	.002333	....	....	
20,000	80,000	.026600	.002600	....	....	
20,500	82,000	.029667	.003067	....	....	
21,000	84,000	.032667	.003000	....	....	
21,500	86,000	.035833	.003166	....	....	
22,000	88,000	.039067	.003834	....	....	
22,500	90,000	.043333	.003066	....	....	
23,000	92,000	.048567	.005234	....	....	
23,500	94,000	.0567	.00·133	....	....	
24,000	96,000	.0667	.0100	....	....	
24,500	98,000	.0767	.0100	....	....	
25,000	100,000	.1067	.0300	....	....	
25,040	100,160	.1333	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,160
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.001633
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.60 from neck
Character of broken surface		silky, 85 per cent.; granular, 15 per cent.
Elongation of inch sections		″.13, ″.31*, ″.10

No. 2847.

Marks, $^{8}\overset{\text{B}_1}{\text{T}},\overset{\text{G}}{\text{O}}^{\text{R}}$

Diameter, ″.564,

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000133	.000133	0.	....	
5,000	20,000	.000567	.000134	0.	....	
6,250	25,000	.000767	.000200	0.	....	
7,500	30,000	.000967	.000200	—.000033	—.000033	
8,750	35,000	.001100	.000133	....	....	
10,000	40,000	.001267	.000167	....	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001433	.000033	....	....	
11,500	46,090	.001500	.000067	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001633	.000033	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	Elastic limit.
13,500	54,000	.001833	.000100	....	....	
13,750	55,000	.002033	.000200	....	....	
14,000	56,000	.002967	.000934	....	....	
14,250	57,000	.003433	.000466	....	....	
14,500	58,000	.004067	.000634	....	....	
14,750	59,000	.004700	.000633	....	....	
15,000	60,000	.005667	.000967	....	....	
15,500	62,000	.007000	.001333	....	....	
16,000	64,000	.008933	.001933	....	....	
16,500	66,000	.010333	.001400	....	....	
17,000	68,000	.012333	.002000	....	....	
17,500	70,000	.014333	.002000	....	....	
18,000	72,000	.016333	.002000	....	....	
18,500	74,000	.018533	.002200	....	....	
19,000	76,000	.020433	.001900	....	....	
19,500	78,000	.022833	.002400	....	....	
20,000	80,000	.024833	.002000	....	....	
20,500	82,000	.027667	.002834	....	....	
21,000	84,000	.030500	.002833	....	....	
21,500	86,000	.033667	.003167	....	....	
22,000	88,000	.037500	.003833	....	....	
22,500	90,000	.041667	.004167	....	....	
23,000	92,000	.046167	.004500	....	....	
23,500	94,000	.0533	.007133	....	....	
24,000	96,000	.0600	.0067	....	....	
24,500	98,000	.0700	.0100	....	....	
25,000	100,000	.0967	.0267	....	....	
25,080	100,320	.1233	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 100,320
Elastic limit per square inch of original section............do.... 53,000
Elongation per inch after rupture ....inch.. 0.1733
Elongation per inch under strain at elastic limit............do.... .001733
Reduction in diameter at point of rupture ....do ... .124
Reduction in area after rupture, per centum of original section 39.3
Position of rupture............″.94 from neck
Character of broken surface............silky
Elongation of inch sections ....″.30, ″.14, ″.08

No. 2848.

Marks, $^{8\,R_1\,G\,R}_{\quad T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
. 250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000100	. 000100	0.	....	
2, 500	10, 000	. 000233	. 000133	0.	....	
3, 750	15, 000	. 000367	. 000134	0.	....	
5, 000	20, 000	. 000533	. 000166	0.	....	
6, 250	25, 000	. 000700	. 000167	0.	....	
7, 500	30, 000	. 000867	. 000167	0.	....	
8, 750	35, 000	. 001067	. 000200	....	....	
10, 000	40, 000	. 001267	. 000200	....	....	
10, 250	41, 000	. 001300	. 000333	....	....	
10, 500	42, 000	. 001367	. 000067	....	....	
10, 750	43, 000	. 001400	. 000033	....	....	
11, 000	44, 000	. 001467	. 000067	....	....	
11, 250	45, 000	. 001500	. 000033	....	....	
11, 500	46, 000	. 001533	. 000033	....	....	
11, 750	47, 000	. 001600	. 000067	....	....	
12, 000	48, 000	. 001633	. 000033	....	....	
12, 250	49, 000	. 001667	. 000034	....	....	
12, 500	50, 000	. 001700	. 000033	....	....	
12, 750	51, 000	. 001733	. 000038	....	....	Elastic limit.
13, 000	52, 000	. 001833	. 000100	....	....	
13, 250	53, 000	. 001933	. 000100	....	....	
13, 500	54, 000	. 002333	. 000400	....	....	
13, 750	55, 000	. 003267	. 000934	....	....	
14, 000	56, 000	. 004000	. 000733	....	....	
14, 500	58, 000	. 004667	. 000667	....	....	
15, 000	60, 000	. 006400	. 001733	....	....	
15, 500	62, 000	. 008233	. 001833	....	....	
16, 000	64, 000	. 009800	. 001567	....	....	
16, 500	66, 000	. 011333	. 001533	....	....	
17, 000	68 000	. 013233	. 001900	....	....	
17, 500	70, 000	. 014967	. 001734	....	....	
18, 000	72, 000	. 017333	. 002366	....	....	
18, 500	74, 000	. 019500	. 002167	....	....	
19, 000	76, 000	. 021333	. 001233	....	....	
19, 500	78, 000	. 023500	. 002167	....	....	
20, 000	80, 000	. 025667	. 002167	....	....	
20, 500	82, 000	. 028200	. 002533	....	....	
21, 000	84 000	. 031233	. 003033	....	....	
21, 500	86, 000	. 034667	. 003434	....	....	
22, 000	88, 000	. 038133	. 003466	....	....	
22, 500	90. 000	. 042333	. 004200	....	....	
23, 000	92, 000	. 047500	. 005167	....	....	
23, 500	94, 000	. 0567	. 0092	....	....	
24, 000	96, 000	. 0633	. 0066	....	....	
24 500	98 000	. 0700	. 0067	....	....	
25, 000	100, 000	. 1033	. 0333	....	....	
25, 020	100, 080	. 1133	. 0100	....	....	Tensile strength.

General summary.

Specific gravity		7. 8583
Hardness		19. 92
Tensile strength per square inch of original section	pounds..	100, 080
Elastic limit per square inch of original section	do...	51, 000
Elongation per inch after rupture	inch..	0. 1733
Elongation per inch under strain at elastic limit	do...	. 001733
Reduction in diameter at point of rupture	do...	. 134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		1″.45 from neck
Character of broken surface		silky; slightly granular at circumference
Elongation of inch sections		″.13, ″.30*, ″.09

No. 2897.

Marks, $^{8\,R_1\,G\,R}_{T_4\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	....	
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000900	.000133	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001233	.000166	0.	....	
11, 250	45, 000	.001400	.000167	....	....	
12, 500	50, 000	.001567	.000167	....	....	
12, 750	51, 000	.001600	.000033	....	....	
13, 000	52, 000	.001667	.000067	....	....	
13, 250	53, 000	.001733	.000066	....	....	
13, 500	54, 000	.001767	.000034	....	....	
13, 750	55, 000	.001800	.000033	....	....	
14, 000	56, 000	.001833	.000033	....	....	
14, 250	57, 000	.001867	.000034	....	....	
14, 500	58, 000	.001900	.000033	....	....	
14, 750	59, 000	.001900	0.	....	....	
15, 000	60, 000	.001933	.000033	....	....	
15, 250	61, 000	.001967	.000034	....	....	
15, 500	62, 000	.002000	.000033	....	....	
15, 750	63, 000	.002033	.000033	....	....	
16, 000	64, 000	.002100	.000067	....	....	
16, 250	65, 000	.002133	.000033	....	....	
16, 500	66, 000	.002167	.000034	....	....	
16, 750	67, 000	.002200	.000033	....	....	
17, 000	68, 000	.002267	.000067	....	....	
17, 250	69, 000	.002333	.000066	....	....	Elastic limit.
17, 500	70, 000	.002500	.000167	....	....	
17, 750	71, 000	.002800	.000300	....	....	
18, 000	72, 000	.002967	.000167	....	....	
18, 250	73, 000	.003333	.000366	....	....	
18, 500	74, 000	.004533	.001200	....	....	
19, 000	76, 000	.006000	.001467	....	....	
19, 500	78, 000	.008000	.002000	....	....	
20, 000	80, 000	.009667	.001667	....	....	
20, 500	82, 000	.011367	.001700	....	....	
21, 000	84, 000	.013300	.001933	....	....	
21, 500	86, 000	.015167	.001867	....	....	
22, 000	88, 000	.017000	.001833	....	....	
22, 500	90, 000	.018667	.001667	....	....	
23, 000	92, 000	.020400	.001733	....	....	
23, 500	94, 000	.022533	.002133	....	....	
24, 000	96, 000	.024600	.002067	....	....	
24, 500	98, 000	.027000	.002400	....	....	
25, 000	100, 000	.029667	.002667	....	....	
25, 500	102, 000	.032500	.002833	....	....	
26, 000	104, 000	.036000	.003500	....	....	
26, 500	106, 000	.039000	.003000	....	....	
27, 000	108, 000	.0433	.0043	....	....	
27, 500	110, 000	.0467	.0034	....	....	
28, 000	112, 000	.0567	.0100	....	....	
28, 500	114, 000	.0667	.0100	....	....	
29, 000	116, 000	.0800	.0133	....	....	
29, 020	116, 080	.0933	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	116, 080
Elastic limit per square inch of original section	do....	69, 000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.002333
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		".75 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".22*, ".10, ".08

No. 2898.

Marks, $\overset{8\ R_1\ G\ R}{T_s\ O}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000500	.000200	0.		
4,000	20,000	.000700	.000200	0.		
5,000	25,000	.000850	.000150	0.		
6,000	30,000	.001000	.000150	0.		
7.000	35,000	.001200	.000200	.000050	.000050	
8,000	40,000	.001350	.000150	.000050	0.	
9,000	45,000	.001530	.000200			
10,000	50,000	.001700	.000150			
10,200	51,000	.001750	.000050			
10,400	52,000	.001750	0.			
10,600	53,000	.001800	.000050			
10,800	54,000	.001850	.000050			
11,000	55,000	.001850	0.			
11,200	56,000	.001900	.000050			
11,400	57,000	.001950	.000050			
11,600	58,000	.002000	.000050			
11,800	59,000	.002030	.000050			
12,000	60,000	.002100	.000050			
12,200	61,000	.002150	.000050			
12,400	62,000	.002200	.000050			
12,600	63,000	.002250	.000050			
12,800	64,000	.002300	.000050			
13,000	65,000	.002350	.000050			
13,200	66,000	.002400	.000050			
13,400	67,000	.002500	.000100			Elastic limit.
13,600	68,000	.002800	.000300			
13,800	69,000	.003200	.000400			
14,000	70,000	.003750	.000550			
14,400	72,000	.004850	.001100			
14,800	74,000	.006300	.001450			
15,200	76,000	.008000	.001700			
15,600	78,000	.009600	.001600			
16,000	80.000	.011050	.001450			
16,400	82,000	.012750	.001700			
16,800	84,000	.014350	.001600			
17,200	86.000	.016000	.001650			
17,600	88,000	.017800	.001800			
18,000	90,000	.019600	.001800			
18,400	92,000	.021600	.002000			
18,800	94,000	.023800	.002200			
19,200	96,000	.025850	.002050			
19,600	98,000	.028300	.002450			
20,000	100,000	.031250	.002950			
20,400	102,000	.033850	.002600			
20,800	104,000	.036800	.002950			
21,200	106,000	.040350	.003550			
21,600	108,000	.045000	.004650			
22,000	110,000	.0500	.0050			
22,400	112,000	.0550	.0050			
22,800	114,000	.0650	.0100			
23,100	115,500	.0950	.0300			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	115,500
Elastic limit per square inch of original section	do....	67,000
Elongation per inch after rupture	inch..	0.1600
Elongation per inch under strain at elastic limit	do....	.002500
Reduction in diameter at point of rupture	do....	.105
Reduction in area after rupture, per centum of original section		87.1
Position of rupture		".30 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		".25*, ".07

GAS-CHECK CUPS.

No. 3313.

Marks, $\begin{smallmatrix}8\ R_1\ G\ C\\ T_1\ O\end{smallmatrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

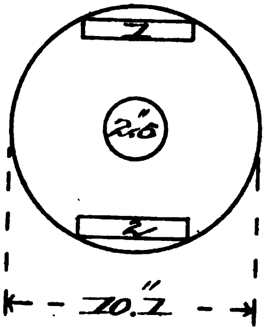
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001300	.000150	0.	....	
9,000	45,000	.001450	.000150	0.	....	
10,000	50,000	.001650	.000200	0.	....	
11,000	55,000	.001850	.000200	....	....	
12,000	60,000	.002000	.000150	....	....	
13,000	65,000	.002200	.000200	....	....	
13,200	66,000	.002250	.000050	....	....	
13,400	67,000	.002300	.000050	....	....	
13,600	68,000	.002300	0.	....	....	
13,800	69,000	.002350	.000050	....	....	
14,000	70,000	.002350	0.	....	....	
14,200	71,000	.002400	.000050	....	....	
14,400	72,000	.002400	0.	....	....	
14,600	73,000	.002450	.000050	....	....	
14,800	74,000	.002500	.000050	....	....	
15,000	75,000	.002550	.000050	....	....	
15,200	76,000	.002600	.000050	....	....	Elastic limit.
15,400	77,000	.003750	.001150	....	....	
15,600	78,000	.005000	.001250	....	....	
15,800	79,000	.005650	.000650	....	....	
16,000	80,000	.006350	.000700	....	....	
16,400	82,000	.007500	.001150	....	....	
16,800	84,000	.008900	.001400	....	....	
17,200	86,000	.010200	.001300	....	....	
17,600	88,000	.011600	.001400	....	....	
18,000	90,000	.012900	.001300	....	....	
18,400	92,000	.014000	.001100	....	....	
18,800	94,000	.015350	.001350	....	....	
19,200	96,000	.016900	.001550	....	....	
19,600	98,000	.018500	.001600	....	....	
20,000	100,000	.019900	.001400	....	....	
20,400	102,000	.021750	.001850	....	....	
20,800	104,000	.023500	.001750	....	....	
21,200	106,000	.025100	.001600	....	....	
21,600	108,000	.0270	.0019	....	....	
22,000	110,000	.0292	.0022	....	....	
22,400	112,000	.0316	.0024	....	....	
23,200	116,000	.0375	.0059	....	....	
24,000	120,000	.0425	.0050	....	....	
24,800	124,000	.0500	.0075	....	....	
25,600	128,000	.0650	.0150	....	....	
26,080	130,400	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	130,400
Elastic limit per square inch of original section	do....	76,000
Elongation per inch after rupture	inch..	0.1550
Elongation per inch under strain at elastic limit	do....	.002600
Reduction in diameter at point of rupture	do....	.085
Reduction in area after rupture, per centum of original section		30.7
Position of rupture		″.75 from neck
Character of broken surface		fine granular; silky center
Elongation of inch sections		″.22*, ″.09

8 inch steel B. L. Rifle

Gas check cups



H Ex No 16 50, 1.

No. 3304.

Marks, $^{8}{}^{R_1\,G\,C}_{T_2\,O}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000550	.000200	0.	....	
4,000	20,000	.000700	.000150	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001050	.000200	0.	....	
7,000	35,000	.001200	.000150	0.	....	
8,000	40,000	.001350	.000150	0.	....	
9,000	45,000	.001500	.000150	0.	....	
10,000	50,000	.001650	.00150	0.	....	
11,000	55,000	.001800	.000150	....	....	
12,000	60,000	.002000	.000200	....	....	
13,000	65,000	.002150	.000150	....	....	
13,200	66,000	.002200	.000050	....	....	
13,400	67,000	.002250	.000050	....	....	
13,600	68,000	.002350	.000100	....	....	
13,800	69,000	.002400	.000050	....	....	
14,000	70,000	.002450	.000050	....	....	
14,200	71,000	.002500	000050	....	....	
14,400	72,000	.002500	0.	....	....	
14,600	73,000	.002550	.000050	....	....	
14,800	74,000	.002600	.000050	....	....	
15,000	75,000	.002600	0.	....	....	
15,200	76,000	.002650	.000050	....	....	
15,400	77,000	.002700	.000050	....	....	Elastic limit.
15,600	78,000	.002800	.000100	....	....	
15,800	79,000	.003600	.000800	....	....	
16,000	80,000	.004900	.001300	....	....	
16,400	82,000	.005950	.001050	....	....	
16,800	84,000	.007050	.001100	....	....	
17,200	86,000	.008100	.001050	....	....	
17,600	88,000	.009500	.001400	....	....	
18,000	90,000	.010450	.000950	....	....	
18,400	92,000	.011750	.001300	....	....	
18,800	94,000	.013100	.001350	....	....	
19,200	96,000	.014600	.001500	....	....	
19,600	98,000	.016400	.001800	....	....	
20,000	100,000	.017450	.001050	....	....	
20,400	102,000	.018750	.001300	....	....	
20,800	104,000	.020100	.001350	....	....	
21,200	106,000	.022000	.001900	....	....	
21,600	108,000	.023600	.001600	....	....	
22,000	110,000	.025500	.001900	....	....	
22,400	112,000	.027400	.001900	....	....	
22,800	114,000	.029500	.002100	....	....	
23,200	116,000	.031900	.002400	....	....	
23,600	118,000	.034250	.002350	....	....	
24,000	120,000	.037250	.003000	....	....	
24,800	124,000	.0450	.007750	....	....	
25,600	128,000	.0550	.0100	....	....	
26,400	132,000	.0800	.0250	....	....	
26,580	132,900	.0900	.0100	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds..	132,900
Elastic limit per square inch of original section..........do....	77,000
Elongation per inch after rupture..........inch..	0.1550
Elongation per inch under strain at elastic limit..........do....	.002700
Reduction in diameter at point of rupture..........do....	.085
Reduction in area after rupture, per centum of original section..........	30.7
Position of rupture..........	″.95 from neck
Character of broken surface..........	fine granular; silky center
Elongation of inch sections..........	″.20*, ″.11

BLOCK CARRIER.

No. 2956.

Marks, $^{8\mathrm{R}_1\mathrm{BC}}$
Diameter, ".564.
Sectional area, .25 square inch.

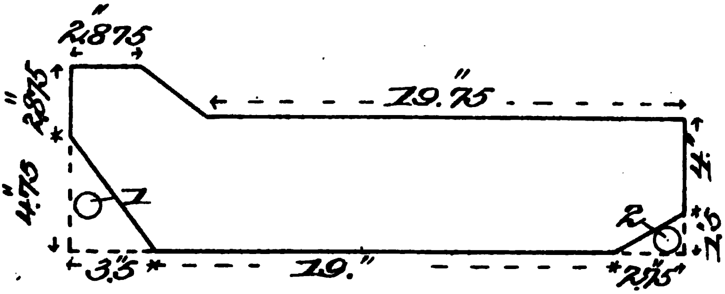
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	.0	.0	.0	.0	Initial load.
1,250	5,000	.000133	.000133	.0	....	
2,500	10,000	.000300	.000167	.0	....	
3,750	15,000	.000467	.000167	.0	....	
5,000	20,000	.000633	.000166	.0	....	
6,250	25,000	.000800	.000167	.0	....	
7,500	30,000	.000967	.000167	.0	....	
8,750	35,000	.001133	.000166	.0	....	
10,000	40,000	.001333	.000200	.0	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001800	.000067	....	....	
13,500	54,000	.001867	.000067	....	....	Elastic limit.
13,750	55,000	.002033	.000166	....	....	
14,000	56,000	.002333	.000300	....	....	
14,250	57,000	.002800	.000467	....	....	
14,500	58,000	.003267	.000467	....	....	
14,750	59,000	.003667	.000400	....	....	
15,000	60,000	.004533	.000866	....	....	
15,250	61,000	.005500	.000967	....	....	
15,500	62,000	.006167	.000667	....	....	
15,750	63,000	.007500	.001333	....	....	
16,000	64,000	.008333	.000833	....	....	
16,500	66,000	.010167	.001834	....	....	
17,000	68,000	.012000	.001833	....	....	
17,500	70,000	.013733	.001733	....	....	
18,000	72,000	.015433	.001700	....	....	
18,500	74,000	.017500	.002067	....	....	
19,000	76,000	.019500	.002000	....	....	
19,500	78,000	.021667	.002167	....	....	
20,000	80,000	.024167	.002500	....	....	
20,500	82,000	.026833	.002666	....	....	
21,000	84,000	.029667	.002834	....	....	
21,500	86,000	.032500	.002833	....	....	
22,000	88,000	.035667	.003167	....	....	
22,500	90,000	.040000	.004333	....	....	
23,000	92,000	.044333	.004333	....	....	
23,500	94,000	.0500	.005667	....	....	
24.000	96,000	.0600	.0100	....	....	
24,500	98,000	.0700	.0100	....	....	
25,000	100,000	.0867	.0167	....	....	
25,200	100,800	.1100	.0233	....	....	Tensile strength.

General summary.

Specific gravity		7.8560
Hardness		20.47
Tensile strength per square inch of original section	pounds..	100,800
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.1600
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1".18 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".18, ".20*, ".10

8 inch steel B.L. Rifle

Block carrier



No. 2957.

Marks, $^{8\ \mathrm{R}_1\ \mathrm{B\ C}}_{2}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001833	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001700	.000200	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001800	.000067	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001967	.000067	....	....	
14,250	57,000	.002033	.000066	....	....	
14,500	58,000	.002067	.000034	....	....	
14,750	59,000	.002100	.000033	....	....	Elastic limit.
15,000	60,000	.002233	.000133	....	....	
15,250	61,000	.002400	.000167	....	....	
15,500	62,000	.002667	.000267	....	....	
15,750	63,000	.002900	.000233	....	....	
16,000	64,000	.003733	.000833	....	....	
16,250	65,000	.004667	.000934	....	....	
16,500	66,000	.005500	.000833	....	....	
17,000	68,000	.007767	.002267	....	....	
17,500	70,000	.009333	.001566	....	....	
18,000	72,000	.011667	.002334	....	....	
18,500	74,000	.013767	.002100	....	....	
19,000	76,000	.015333	.001566	....	....	
19,500	78,000	.017367	.002034	....	....	
20,000	80,000	.019500	.002133	....	....	
20,500	82,000	.022167	.002667	....	....	
21,000	84,000	.024733	.002566	....	....	
21,500	86,000	.027067	.002334	....	....	
22,000	88,000	.030167	.003100	....	....	
22,500	90,000	.033333	.003166	....	....	
23,000	92,000	.037000	.003667	....	....	
23,500	94,000	.041333	.004333	....	....	
24,000	96,000	.046667	.005334	....	....	
24,500	98,000	.0533	.006633	....	....	
25,000	100,000	.0633	.0100	....	....	
25,500	102,000	.0733	.0100	....	....	
25,840	103,360	.1033	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	103,360
Elastic limit per square inch of original section ....do....	59,000
Elongation per inch after rupture ....inch..	0.1700
Elongation per inch under strain at elastic limit............do....	.002100
Reduction in diameter at point of rupture............do....	.154
Reduction in area after rupture, per centum of oirginal section	47.2
Position of rupture	1″.20 from neck
Character of broken surface	silky; trace of granulation
Elongation of inch sections............	″.20*, ″.22*, ″.09

SPINDLE.

No. 3196.

Marks, $\overset{S\,R}{T}, \overset{S\,P}{M}$
Diameter, ".564.
Sectional area, .25 square inch.

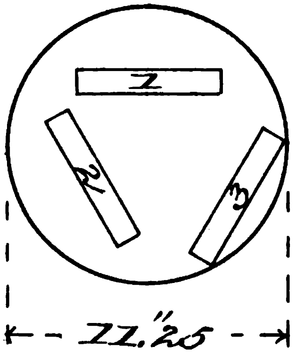
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000433	.000133	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	....	....	
10, 000	40, 000	.001333	.000233	....	....	
11, 250	45, 000	.001467	.000134	....	....	
12, 500	50, 000	.001667	.000200	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001733	.000033	....	....	
13, 250	53, 000	.001767	.000034	....	....	
13, 500	54, 000	.001800	.000033	....	....	
13, 750	55, 000	.001833	.000033	....	....	
14, 000	56, 000	.001867	.000034	....	....	
14, 250	57, 000	.001933	.000066	....	....	Elastic limit.
14, 500	58, 000	.002033	.000100	....	....	
14, 750	59, 000	.002167	.000134	....	....	
15, 000	60, 000	.003900	.001733	....	....	
15, 500	62, 000	.006500	.002600	....	....	
16, 000	64, 000	.008233	.001733	....	....	
16, 500	66, 000	.009667	.001434	....	....	
17, 000	68, 000	.011333	.001666	....	....	
17, 500	70, 000	.013000	.001667	....	....	
18, 000	72, 000	.014667	.001667	....	....	
18, 500	74, 000	.016333	.001666	....	....	
19, 000	76, 000	.018200	.001867	....	....	
19, 500	78, 000	.020233	.002033	....	....	
20, 000	80, 000	.022333	.002100	....	....	
20, 500	82, 000	.024667	.002334	....	....	
21, 000	84, 000	.026933	.002266	....	....	
21, 500	86, 000	.029667	.002734	....	....	
22, 000	88, 000	.032667	.003000	....	....	
22, 500	90, 000	.035800	.003133	....	....	
23, 000	92, 000	.039500	.003700	....	....	
23, 500	94, 000	.0433	.0038	....	....	
24, 000	96, 000	.0500	.0067	....	....	
24, 500	98, 000	.0567	.0067	....	....	
25, 000	100, 000	.0633	.0066	....	....	
25, 500	102, 000	.0733	.0100	....	....	
26, 000	104, 000	.1067	.0334	....	....	Tensile strength.

General summary.

Specific gravity		7.8533
Hardness		21.52
Tensile strength per square inch of original section	pounds..	104.000
Elastic limit per square inch of original section	do..	57,000
Elongation per inch after rupture	inch..	.1800
Elongation per inch under strain at elastic limit	do....	.001933
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1".45 from neck
Character of broken surface		silky
Elongation of inch sections		".16, ".30, ".08

8 inch steel B.L. Rifle

Spindle



No. 3197.

Marks, $^{8\,R_1\,S\,P}_{T_2\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001833	.000066	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001900	.000033	....	....	
14,250	57,000	.001967	.000067	....	....	Elastic limit.
14,500	58,000	.002067	.000100	....	....	
14,750	59,000	.002300	.000233	....	....	
15,000	60,000	.004267	.001967	....	....	
15,500	62,000	.006167	.001900	....	....	
16,000	64,000	.007867	.001700	....	....	
16,500	66,000	.009333	.001466	....	....	
17,000	68,000	.010933	.001600	....	....	
17,500	70,000	.012667	.001734	....	....	
18,000	72,000	.014333	.001666	....	....	
18,500	74,000	.015967	.001634	....	....	
19,000	76,000	.018000	.002033	....	....	
19,500	78,000	.020133	.002133	....	....	
20,000	80,000	.022267	.002134	....	....	
20,500	82,000	.023933	.001666	....	....	
21,000	84,000	.026600	.002667	....	....	
21,500	86,000	.029167	.002567	....	....	
22,000	88,000	.031833	.002666	....	....	
22,500	90,000	.035000	.003167	....	....	
23,000	92,000	.038500	.003500	....	....	
23,500	94,000	.042133	.003633	....	....	
24,000	96,000	.0467	.004567	....	....	
24,500	98,000	.0533	.0066	....	....	
25,000	100,000	.0600	.0067	....	....	
25,500	102,000	.0700	.0100	....	....	
26,000	104,000	.0900	.0200	....	....	
26,180	104,720	.1100	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	104,720
Elastic limit per square inch of original section	do	57,000
Elongation per inch after rupture	inch	0.2033
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.15 from neck
Character of broken surface		silky
Elongation of inch sections		″.26*, ″.21, ″.14

No. 3198.

Marks, $^{S\,R_1\,S\,P}_{T_3\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000183	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7. 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001100	.000133	—. 000033	—. 000033	
10, 000	40, 000	.001267	.000167	—. 000033	0.	
11, 250	45, 000	.001467	.000200	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001767	.000067	....	....	
13, 500	54, 000	.001767	0.	....	....	
13, 750	55, 000	.001867	.000100	....	....	
14, 000	56, 000	.001900	.000033	....	....	
14, 250	57, 000	.001933	.000033	....	....	
14, 500	58, 000	.002000	.000067	....	....	
14, 750	59, 000	.002033	.000033	....	....	Elastic limit.
15, 000	60, 000	.002267	.000234	....	....	
15, 250	61, 000	.003567	.001300	....	....	
15, 500	62, 000	.005167	.001600	....	....	
16, 000	64, 000	.007067	.001900	....	....	
16, 500	66, 000	.008733	.001666	....	....	
17, 000	68, 000	.010400	.001667	....	....	
17, 500	70, 000	.012167	.001767	....	....	
18, 000	72, 000	.014000	.001833	....	....	
18, 500	74, 000	.015667	.001667	....	....	
19, 000	76, 000	.017567	.001900	....	....	
19, 500	78, 000	.019567	.002000	....	....	
20, 000	80, 000	.021933	.002366	....	....	
20, 500	82, 000	.024000	.002167	....	....	
21, 000	84, 000	.026200	.002200	....	....	
21, 500	86, 000	.029033	.002833	....	....	
22, 000	88, 000	.031667	.002634	....	....	
22, 500	90, 000	.035167	.003500	....	....	
23, 000	92, 000	.038333	.003166	....	....	
23, 500	94, 000	.042667	.004334	....	....	
24, 000	96, 000	.0467	.004033	....	....	
24, 500	98, 000	.0533	.0066	....	....	
25, 000	100, 000	.0600	.0067	....	....	
25, 500	102, 000	.0700	.0100	....	....	
26, 000	104, 000	.0967	.0267	....	....	
26, 080	104, 320	.1100	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104, 320
Elastic limit per square inch of original section	do....	59, 000
Elongation per inch after rupture	inch..	0.1833
Elongation per inch under strain at elastic limit	do....	.002033
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.70 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.12, ″.09

NEW SPINDLE FORGING.

No. 3171.

Marks, $^{SR_1SP}_{T_4O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.	....	
2, 500	10, 000	.000200	.000133	0.	....	
3, 750	15, 000	.000367	.000167	0.	....	
5, 000	20, 000	.000533	.000166	0.	....	
6, 250	25, 000	.000700	.000167	0.	....	
7, 500	30, 000	.000867	.000167	0.	....	
8, 750	35, 000	.001000	.000133	0.	....	
10, 000	40, 000	.001200	.000200	0.	....	
11, 250	45, 000	.001367	.000167	....	....	
12, 500	50, 000	.001567	.000200	....	....	
12, 750	51, 000	.001633	.000066	....	....	
13, 000	52, 000	.001667	.000034	....	....	
13, 250	53, 000	.001700	.000033	....	....	
13, 500	54, 000	.001733	.000033	....	....	
13, 750	55, 000	.001767	.000034	....	....	
14, 000	56, 000	.001767	0.	....	....	
14, 250	57, 000	.001800	.000033	....	....	
14, 500	58, 000	.001867	.000067	....	....	
14, 750	59, 000	.001900	.000033	....	....	
15, 000	60, 000	.001967	.000067	....	....	
15, 250	61, 000	.002067	.000100	....	....	Elastic limit.
15, 500	62, 000	.002867	.000800	....	....	
15, 750	63, 000	.004000	.001133	....	....	
16, 000	64, 000	.005000	.001000	....	....	
16, 500	66, 000	.006767	.001767	....	....	
17, 000	68, 000	.008167	.001400	....	....	
17, 500	70, 000	.009700	.001533	....	....	
18, 000	72, 000	.011333	.001633	....	....	
18, 500	74, 000	.012667	.001334	....	....	
19, 000	76, 000	.014000	.001333	....	....	
19, 500	78, 000	.015833	.001833	....	....	
20, 000	80, 000	.017500	.001677	....	....	
20, 500	82, 000	.019333	.001833	....	....	
21, 000	84, 000	.021333	.002000	....	....	
21, 500	86, 000	.023333	.002000	....	....	
22, 000	88, 000	.025400	.002067	....	....	
22, 500	90, 000	.027933	.002533	....	....	
23, 000	92, 000	.030567	.002634	....	....	
23, 500	94, 000	.033233	.002666	....	....	
24, 000	96, 000	.036833	.003600	....	....	
24, 500	98, 000	.040233	.003400	....	....	
25, 000	100, 000	.044500	.004267	....	....	
25, 500	102, 000	.0500	.0055	....	....	
26, 000	104, 000	.0567	.0067	....	....	
26, 500	106, 000	.0667	.0100	....	....	
27, 000	108, 000	.0767	.0100	....	....	
27, 330	109, 320	.1100	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	109, 320
Elastic limit per square inch of original section	do....	61, 000
Elongation per inch after rupture	inch..	0. 1933
Elongation per inch under strain at elastic limit	do....	.002067
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		1″.20 from neck
Character of broken surface		granular, 50 per cent.; silky, 50 per cent.
Elongation of inch sections		″.12, ″.22*, ″.24*

No. 3172.

Marks, $^{\text{S R, S P}}_{\text{T, S M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	
1, 250	5, 000	.000133	.000133	0.	....	Initial load.
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000500	.000200	0.	....	
5, 000	20, 000	.000633	.000133	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001733	.000033	....	....	
13, 500	54, 000	.001800	.000067	....	....	
13, 750	55, 000	.001867	.000067	....	....	Elastic limit.
14, 000	56, 000	.001967	.000100	....	....	
14, 250	57, 000	.002133	.000166	....	....	
14, 500	58, 000	.002867	.000734	....	....	
14, 750	59, 000	.004067	.001200	....	....	
15, 000	60, 000	.005233	.001166	....	....	
15, 500	62, 000	.006800	.001567	....	....	
16, 000	64, 000	.008333	.001533	....	....	
16, 500	66, 000	.009833	.001500	....	....	
17, 000	68, 000	.011367	.001534	....	....	
17, 500	70, 000	.013000	.001633	....	....	
18, 000	72, 000	.014500	.001500	....	....	
18, 500	74, 000	.016167	.001667	....	....	
19, 000	76, 000	.017833	.001666	....	....	
19, 500	78, 000	.019867	.002034	....	....	
20, 000	80, 000	.021700	.001833	....	....	
20, 500	82, 000	.023767	.002067	....	....	
21, 000	84, 000	.026200	.002433	....	....	
21, 500	86, 000	.028567	.002367	....	....	
22, 000	88, 000	.031500	.002933	....	....	
22, 500	90, 000	.034667	.003167	....	....	
23, 000	92, 000	.038333	.003666	....	....	
23, 500	94, 000	.042500	.004167	....	....	
24, 000	96, 000	.046833	.004333	....	....	
24, 500	98, 000	.052000	.005167	....	....	
25, 000	100, 000	.0600	.0080	....	....	
25, 500	102, 000	.0700	.0100	....	....	
26, 000	104, 000	.0933	.0233	....	....	
26, 170	104, 680	.1100	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104, 680
Elastic limit per square inch of original section	do ...	55, 000
Elongation per inch after rupture	inch..	0. 1767
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		1″.40 from neck
Character of broken surface		granular, radiating from a silky spot at the circumference
Elongation of inch sections		″.13. ″.26, ″.14

No. 3173.

Marks, $^{8}\,\overset{R_1}{T_6}\,\overset{S\,P}{M}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001733	.000066	....	....	
13, 250	53, 000	.001800	.000067	....	....	
13, 500	54, 000	.001833	.000033	....	....	
13, 750	55, 000	.001867	.000034	....	....	Elastic limit.
14, 000	56, 000	.001967	.000100	....	....	
14, 250	57, 000	.002233	.000266	....	....	
14, 500	58, 000	.003567	.001334	....	....	
14, 750	59, 000	.004500	.000933	....	....	
15, 000	60, 000	.005367	.000867	....	....	
15, 500	62, 000	.006667	.001300	....	....	
16, 000	64, 000	.008167	.001500	....	....	
16, 500	66, 000	.009667	.001500	....	....	
17, 000	68, 000	.011000	.001333	....	....	
17, 500	70, 000	.012667	.001667	....	....	
18, 000	72, 000	.014167	.001500	....	....	
18, 500	74, 000	.015667	.001500	....	....	
19, 000	76, 000	.017333	.001666	....	....	
19, 500	78, 000	.019133	.001800	....	....	
20, 000	80, 000	.021167	.002034	....	....	
20, 500	82, 000	.023000	.001833	....	....	
21, 000	84, 000	.025067	.002067	....	....	
21, 500	86, 000	.027667	.002600	....	....	
22, 000	88, 000	.030000	.002333	....	....	
22, 500	90, 000	.033000	.003000	....	....	
23, 000	92, 000	.036000	.003000	....	....	
23, 500	94, 000	.039667	.003667	....	....	
24, 000	96, 000	.014000	.004333	....	....	
24, 500	98, 000	.048333	.004333	....	....	
25, 000	100, 000	.0567	.008367	....	....	
25, 500	102, 000	.0633	.0066	....	....	
26, 000	104, 000	.0733	.0100	....	....	
26, 320	105, 280	.1033	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105, 280
Elastic limit per square inch of original section	do ...	55. 000
Elongation per inch after rupture	inch..	0. 1633
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do ...	.125
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		1″.00 from neck
Character of broken surface		silky; in part interspersed with granular metal
Elongation of inch sections		″.10, ″.30*, ″.09

HINGE PIN.

No. 2819.

Marks, 8 R$_{L}$H P
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	....	....	
10, 000	40, 000	.001333	.000166	....	....	
11, 250	45, 000	.001500	.000167	....	....	
12, 500	50, 000	.001700	.000200	....	....	
13, 750	55, 000	.001867	.000167	....	....	
14, 000	56, 000	.001900	.000033	....	....	
14, 250	57, 000	.001933	.000033	....	....	
14, 500	58, 000	.001967	.000034	....	....	
14, 750	59, 000	.002033	.000066	....	....	
15, 000	60, 000	.002067	.000034	....	....	Elastic limit.
15, 250	61, 000	.002567	.000500	....	....	
15, 500	62, 000	.002767	.000200	....	....	
15, 750	63, 000	.003133	.000366	....	....	
16, 000	64, 000	.003433	.000300	....	....	
16, 250	65, 000	.004067	.000634	....	....	
16, 500	66, 000	.004700	.000633	....	....	
16, 750	67, 000	.005267	.000567	....	....	
17, 000	68, 000	.005833	.000566	....	....	
17, 250	69, 000	.006600	.000767	....	....	
17, 500	70, 000	.007267	.000667	....	....	
18, 000	72, 000	.008700	.001433	....	....	
18, 500	74, 000	.010100	.001400	....	....	
19, 000	76, 000	.011633	.001533	....	....	
19, 500	78, 000	.013033	.001400	....	....	
20, 000	80, 000	.014633	.001600	....	....	
20, 500	82, 000	.016200	.001567	....	....	
21, 000	84, 000	.017867	.001667	....	....	
21, 500	86, 000	.019867	.002000	....	....	
22, 000	88, 000	.021700	.001833	....	....	
22, 500	90, 000	.023633	.001933	....	....	
23, 000	92, 000	.026033	.002400	....	....	
23, 500	94, 000	.028200	.002167	....	....	
24, 000	96, 000	.030733	.002533	....	....	
24, 500	98, 000	.033600	.002867	....	....	
25, 000	100, 000	.036933	.003333	....	....	
25, 500	102, 000	.0383	.001367	....	....	
26, 000	104, 000	.0417	.0034	....	....	
26, 500	106, 000	.0500	.0083	....	....	
27, 000	108, 000	.0567	.0067	....	....	
27, 500	110, 000	.0733	.0166	....	....	
28, 000	112, 000	.0967	.0234	....	....	Tensile strength.

General summary.

Specific gravity 7. 853
Hardness 25. 5
Tensile strength per square inch of original section .... pounds.. 112, 000
Elastic limit per square inch of original section .... do.... 60, 000
Elongation per inch after rupture .... inch.. 0. 1267
Elongation per inch under strain at elastic limit .... do.... .002067
Reduction in diameter at point of rupture .... do.... .104
Reduction in area after rupture, per centum of original section .... 33.
Position of rupture .... ″.75 from neck
Character of broken surface .... granular; dull spot at center
Elongation of inch sections .... ″.23*, ″.08, ″.07

8 inch steel B. L. Rifle

Hinge pin

TABULATION OF TENSION SPECIMENS FROM 8" STEEL B. L. RIFLE.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per cent.*				
3398	Lining tube	Middle	42,000	72,320	22.0	47.2	Silky			Breech end.
3399	do	do	43,000	73,080	26.0	49.7	do	7.8576	12.36	Do.
3400	do	do	45,000	73,200	25.7	49.7	do			Do.
3401	do	do	39,000	76,560	18.7	30.6	Silky, serrated. 50 per cent.; granular, 50 per cent.			Muzzle end.
3402	do	do	41,000	77,360	20.7	33.5	Silky, serrated	7.8548	12.72	Do.
3403	do	do	43,000	81,920	15.3	36.4	do			Do.
3134	Jacket	Inside	46,000	98,400	17.8	36.4	Silky, slight granulation			Breech end.
3135	do	Outside	55,000	110,000	10.3	21.4	Granular, dull spot			Do.
3136	do	Middle	47,000	100,800	12.7	21.4	Granular, dull streak	7.8526	20.36	Do.
3155	do	do	45,000	95,760	12.7	15.0	Granular, dull spot			Breech end, additional specimens.
3156	do	Inside	45,000	94,240	20.3	44.6	Silky			Do.
3157	do	Middle	45,000	94,800	13.0	18.3	Granular, dull spot			Do.
3158	do	Outside	55,000	108,400	10.8	15.0	do			Do.
3354	do	Inside	46,000	91,240	22.8	44.6	Silky			Do.
3355	do	Outside	50,000	101,000	10.0	15.0	Granular, silky spot			Do.
3356	do	Middle	43,000	89,100	20.0	40.3	Silky			Do.
3130	do	Inside	54,000	106,000	10.7	11.8	Granular, dull spot			Muzzle end.
3132	do	Outside	52,000	103,200	14.7	24.6	do			Do.
3133	do	Middle	50,000	103,600	16.8	21.4	do	7.8533	21.05	Do.
3159	do	do	45,000	95,920	18.8	33.5	Granular, 70 per cent.; silky, 30 per cent.			Muzzle end, additional specimens.
3160	do	Inside	51,000	100,720	15.3	18.3	Granular			Do.
3161	do	Middle	49,000	97,520	14.0	18.3	Granular, dull spot			Do.
3162	do	Outside	52,000	98,640	15.3	24.6	do			Do.
3357	do	Inside	49,000	97,680	19.0	36.4	Silky, slightly granulation			Do.
3358	do	Outside	47,000	94,360	15.7	21.4	Granular, silky spot			Do.
3359	do	Middle	46,000	92,920	20.0	39.2	Silky and granular			Do.
2921	Hoop A_1	do	55,000	109,720	16.2	36.4	Granular, silky center	7.8527	23.84	
2922	do	Outside	57,000	111,440	14.0	33.4	do			
2923	do	Middle	57,000	112,000	14.3	39.2	do			
2924	do	Inside	63,000	116,160	13.7	30.2	do			
3118	Hoop A_2	Middle	55,000	112,160	13.0	30.6	do	7.8516	23.84	
3119	do	Outside	58,000	114,400	11.8	30.6	do			
3120	do	Middle	56,000	111,400	13.0	33.5	do			
3121	do	Inside	59,000	116,320	12.0	33.5	od			

TABULATION OF TENSION SPECIMENS FROM 8" STEEL B. L. RIFLE—Continued.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per cent*				
3188	Hoop A_4	Middle	49,000	102,640	15.2	36.4	Granular, silky center	7.8540	21.17	
3189	......do	Outside	56,000	112,080	12.3	27.6	Granular, silky spot			
3190	......do	Middle	55,000	107,680	12.3	30.6	Granular, silky center			
3191	......do	Inside	51,000	103,920	14.0	36.4	......do			
3152	......do	...do	50,000	105,960	13.0	33.5	......do			Additional specimens.
3153	......do	Outside	54,000	113,640	9.7	21.4	Granular, dull spot			Do.
3154	......do	Middle	45,000	105,120	11.0	27.6	Granular, silky center			Do.
3362	......do	Inside	57,000	111,560	12.8	41.9	......do			New hoop.
3363	......do	Middle	55,000	113,040	11.7	33.5	......do			Do.
2364	......do	Outside	57,000	113,680	11.8	33.5	......do			Do.
3365	......do	Middle	51,000	110,400	12.3	39.2	Silky, partly granular			Do.
3076	Hoop A_5	....do	53,000	108,120	14.7	33.5	Granular, silky center	7.8528	23.17	
3077	......do	Outside	56,000	113,960	12.8	30.6	......do			
3078	......do	Middle	54,000	110,800	13.3	33.5	......do			
3078½	......do	Inside	59,000	112,480	13.2	33.5	......do			
3079	Hoop A_6	Middle	59,000	113,760	12.2	33.5	......do	7.8511	24.69	
3080	......do	Outside	61,000	115,560	12.8	33.5	......do			
3081	......do	Middle	55,000	112,720	14.7	30.6	......do			
3082	......do	Inside	57,000	110,440	12.7	30.6	......do			
3192	Hoop A_7	Middle	49,000	106,400	13.3	33.5	......do	7.8484	21.52	
3193	......do	Outside	59,000	118,640	11.7	27.6	......do			
3194	......do	Inside	44,000	99,040	14.7	36.4	......do			
3195	......do	Middle	48,000	103,920	13.0	33.5	......do			
3237	......do	....do	54,000	109,920	13.8	30.6	......do	7.8505	22.77	New hoop.
3238	......do	Outside	55,000	111,240	13.7	30.6	......do			Do.
3239	......do	Middle	53,000	110,600	13.0	33.5	Silky, 50 per cent.; granular, 50 per cent.			Do.
3240	......do	Inside	59,000	113,760	9.8	27.6	Granular, silky center			Do.
3052	Hoop C_1	...do	61,000	112,820	16.3	30.6	Granular, silky spot			
3053	......do	Outside	59,000	111,920	16.7	36.4	...do			
3054	......do	Middle	57,000	108,280	17.3	30.6	Silky, 60 per cent.; granular, 40 per cent.	7.8525	22.26	
3055	......do	Inside	60,000	110,080	17.3	41.9	Silky, slightly granular			
3056	......do	Outside	56,000	104,280	19.3	39.2	Silky			
3057	......do	Middle	56,000	106,960	18.3	39.2	Silky, slightly granular			

2913	Hoop C_3	Inside	61, 000	104, 240	20. 0	49. 7	Silky			
2914	do	Outside	55, 000	102, 360	19. 7	49. 7	do			
2915	do	Middle	55, 000	102, 000	11. 8	15. 0	Granular, flaky spot	7. 8484	21. 76	
2940	do	Inside	60, 000	103, 920	19. 8	49. 7	Silky; trace of granulation			Additional specimen.
2941	do	Outside	56, 000	101, 520	18. 7	47. 2	do			Do.
2942	do	Middle	52, 000	99, 800	18. 8	49. 7	Silky			Do.
2994	Hoop C_3	Inside	59, 000	108, 240	18. 0	41. 9	do			
2995	do	Outside	58, 000	106, 760	11. 7	15. 0	Granular, dull spot			
2996	do	Middle	57, 000	104, 800	16. 0	36. 4	Silky	7. 8461	20. 47	
2997	do	Inside	61, 000	111, 240	16. 0	36. 4	Silky and fine granulation			
2998	do	Outside	55, 000	110, 600	15. 7	21. 4	Granular, flaky spot			
2999	do	Middle	55, 000	105, 000	14. 0	18. 3	do			
3109	do	Inside	56, 000	106, 800	16. 7	41. 9	Silky; trace of granulation			Do.
3110	do	Outside	57, 000	108, 000	17. 3	36. 4	Silky and granular			Do.
3111	do	Middle	55, 000	106, 720	11. 7	21. 4	Granular, dull spot			Do.
3112	do	Inside	67,000	118, 400	15. 7	36. 4	Granular, silky center			Do.
3113	do	Outside	60, 000	106, 800	14. 0	21. 4	Granular, dull spot			Do.
3114	do	Middle	61, 000	112, 240	13. 7	24. 6	do			Do.
3058	Hoop C_4	Inside	63, 000	116, 960	14. 7	36. 4	Granular, 60 per cent.; silky, 40 per cent.			
3050	do	Outside	57, 000	112, 800	15. 7	21. 4	Granular, dull spot			
3060	do	Middle	55, 000	110, 800	15. 7	33. 5	Granular, silky center	7. 8509	21. 64	
3061	do	Inside	61, 000	115, 400	18. 0	18. 3	Granular, dull spot			
3062	do	Outside	55, 000	109, 280	17. 7	27. 6	Granular, silky spot			
3063	do	Middle	52, 000	106, 400	15. 0	27. 6	do			
3089	do	Inside	63, 000	116, 560	16. 7	36. 4	do			Do.
3090	do	Outside	57, 000	109, 960	14. 0	21. 4	do			Do.
3091	do	Middle	53, 000	107, 640	15. 7	24. 6	Granular, dull spot			Do.
2889	Hoop C_5	Inside	57, 000	98, 800	21. 0	54. 6	Fine, silky			
2890	do	Outside	57, 000	100, 240	19. 7	44. 6	Silky			
2891	do	Middle	55, 000	101, 640	19. 3	44. 6	Silky and fine granulation	7. 8484	20. 03	
3222	do	Inside	60, 000	115, 840	16. 8	33. 5	Granular, silky center			Second hoop.
3223	do	Outside	57, 000	113, 680	14. 3	30. 6	do			Do.
3224	do	Middle	52, 000	110, 200	13. 7	30. 6	do	7. 8509	23. 03	Do.
3225	do	Inside	59, 000	116, 760	15. 7	30. 6	do			Do.
3226	do	Outside	60, 000	116, 240	15. 0	30. 6	do			Do.
3227	do	Middle	54, 000	112, 080	16. 0	30 6	do			Do.
3137	do	Inside	61, 000	117, 600	13. 0	30. 6	Granular, dull center			Second hoop, additional specimen.
3138	do	Outside	56, 000	112, 400	13. 7	27. 6	Granular, dull spot			Do.
3139	do	Middle	51, 000	110, 000	16. 3	30. 6	Granular, dull center			Do.
2968	Hoop C_6	Inside	59, 000	103, 080	17. 3	36. 4	Silky			
2969	do	Outside	59, 000	103, 120	17. 7	36. 4	Silky; trace of granulation			
2970	do	Middle	60, 000	101, 840	18. 0	39. 2	Silky	7. 8486	20. 03	
3216	do	Inside	59, 000	112, 040	16. 0	33. 5	Granular, silky center			Second hoop.
3217	do	Outside	53, 000	107, 520	16. 0	33. 5	Silky and granular			Do.
3218	do	Middle	55, 000	109, 440	14. 3	33. 5	Granular, silky center	7. 8509	23. 03	Do.

TABULATION OF TENSION SPECIMENS FROM 8" STEEL B. L. RIFLE—Continued.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per cent.*				
2892	Hoop C_7	Inside	55,000	102,000	16.7	41.9	Silky			
2893	do	Outside	58,000	101,640	18.7	47.2	do			
2894	do	Middle	57,000	104,920	16.7	39.2	Silky and fine granulation	7.8461	22.02	
3219	do	Inside	54,000	109,680	15.0	30.6	Granular, silky center			Second hoop
3220	do	Outside	54,000	109,520	16.3	30.6	do			Do.
3221	do	Middle	53,000	108,400	15.7	30.6	do	7.8486	21.52	Do.
2916	Hoop C_8	Inside	55,000	105,720	16.0	41.9	Silky, slightly granular			
2917	do	Outside	55,000	107,200	16.0	36.4	do			
2918	do	Middle	57,000	106,880	16.3	41.9	do	7.8485	21.89	
3115	do	Inside	58,000	114,480	12.7	30.6	Granular, silky center			Do.
3116	do	Outside	53,000	108,240	15.3	33.5	do			Do.
3117	do	Middle	52,000	107,920	16.7	30.6	do	7.8492	21.89	Do.
3149	do	Inside	59,000	113,280	12.7	33.5	do			Second hoop, additional specimen.
3150	do	Outside	53,000	109,360	16.3	33.5	do			Do.
3151	do	Middle	55,000	109,160	16.3	30.6	do			Do.
3231	Hoop D_1	Inside	47,000	97,200	13.8	41.9	Silky; trace of granulation			
3232	do	Outside	51,000	107,600	10.7	27.6	Granular, dull center	7.8470	24.51	
3233	do	Middle	48,000	100,000	14.0	36.4	Silky, 60 per cent.; granular, 40 per cent			
3459	do	Inside	57,000	110,680	15.3	44.6	Silky			New hoop.
3460	do	Outside	56,000	109,960	15.0	36.4	Granular, silky center			Do.
3461	do	Middle	59,000	110,520	16.7	44.6	Silky			Do.
3146	Hoop D_2	Inside	50,000	109,000	10.3	24.6	Granular, dull spot			
3147	do	Outside	55,000	112,280	12.0	27.6	Granular, silky center			
3148	do	Middle	49,000	106,760	12.8	30.6	do	7.8518	23.17	
3333	do	Inside	47,000	97,960	16.2	36.4	Silky			Additional specimen.
3334	do	Outside	48,000	104,440	13.8	30.6	Silky, partly granular			Do.
3335	do	Middle	48,000	108,280	11.7	30.6	Granular, 60 per cent.; silky, 40 per cent			Do.
3392	do	Inside	51,000	105,240	12.0	30.6	Granular, silky center			New hoop.
3393	do	Outside	51,000	108,280	11.2	24.6	Granular, 60 per cent.; silky, 40 per cent			Do.
3394	do	Middle	51,000	109,120	10.0	27.6	Granular, silky center			Do.
3127	Hoop D_3	Inside	50,000	110,800	11.0	27.6	Granular, dull center			

3128	......do	Outside	51,000	107,600	12.8	30.6	Granular, silky center	7.8557	23.17	
3129	......do	Middle	50,000	108,400	11.8	27.6	......do			
3174	......do	Inside	54,000	114,200	9.8	24.6	......do			Additional specimen.
3175	......do	Outside	51,000	108,640	12.8	30.6	......do			Do.
3176	......do	Middle	53,000	111,720	12.7	30.6	......do			Do.
2919	Hoop R_1	....do	60,000	110,360	16.0	33.5	......do	7.8472	23.98	
2937	Breech block	....do	55,000	104,800	17.3	30.6	Silky, 40 per cent.; granular, 60 per cent	7.8521	21.64	
2938	......do	....do	54,000	103,240	17.7	33.5	Silky, slightly granular			
2939	......do	Outside	54,000	104,000	16.7	36.4	Silky			
2945	Breech bushing ring	Inside	59,000	107,600	11.7	36.4	Silky and fine granulation			
2946	......do	Outside	63,000	106,960	14.5	39.2	Silky			
2047	......do	Middle	56,000	104,560	11.8	39.2	......do	7.8525	22.26	
2948	......do	Inside	63,000	109,100	19.0	43.3	Fine silky			
2949	......do	Outside	67,000	110,050	21.5	46.2	......do			
2950	......do	Middle	57,000	104,550	23.0	43.3	......do			
2846	Gas-check ring	Inside	49,000	100,160	18.0	39.2	Silky, 85 per cent.; granular, 15 per cent			
2847	......do	Outside	53,000	100,320	17.3	30.2	Silky			
2848	......do	Middle	51,000	100,080	17.3	41.0	Silky, slightly granular	7.8583	19.92	
2897	......do	Inside	69,000	116,080	13.8	33.5	Granular, silky center			
2898	......do	Outside	67,000	115,500	16.0	37.1	Silky trace of granulation			
3303	Gas-check cups	....do	76,000	130,400	15.5	30.7	Fine granulation, silky center			
3304	......do	....do	77,000	132,900	15.5	30.7	......do			
2956	Block-carrier		54,000	100,800	16.0	36.4	Granular, silky center	7.8560	20.47	
2957	......do		59,000	103,360	17.0	47.2	Silky trace of granulation			
3196	Spindle	Middle	57,000	104,000	18.0	47.2	Silky	7.8533	21.52	
3197	......do	....do	57,000	104,720	20.3	41.9	......do			
3198	......do	Outside	59,000	104,320	18.3	47.2	......do			
3171	......do	....do	61,000	109,320	19.3	39.2	Granular, 50 per cent.; silky, 50 per cent			New forging.
3172	......do	Middle	55,000	104,680	17.7	30.6	Granular, silky spot			Do.
3173	......do	....do	55,000	105,280	16.3	39.2	Silky, partly granular			Do.
2819	Hinge pin		60,000	112,000	12.7	33.5	Granular, dull spot	7.8558	25.58	

The elongations were all measured in 3 inches with the exception of the following: Hoops A and D, and the first three specimens from bushing ring, which were measured in 6 inches, and the other three specimens from bushing ring in 2 inches.

TABULATION OF COMPRESSION SPECIMENS FROM 8" STEEL B. L. RIFLE.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Pounds.	*Pounds.*		
727	Jacket.....	Inside	49,000	98,200	Triple flexure ..	Breech end.
728	....do	Outside.....	52,000	107,600	....do	Do.
729	....do	Middle	49,000	98,200	....do	Do.
730	....do	Radial	44,000	107,200	....do	Do.
731	....do	....do	46,0 0	105,800	....do	Do.
739	....do	Middle	47,000	88,120	....do	Breech end, additional specimen.
722	....do	Inside	57,000	109,200	....do	Muzzle end.
723	....do	Outside.....	51,000	101,400	....do	Do.
724	....do	Middle	49,000	102,800	....do	Do.
725	....do	Radial......	50,000	103,600	....do	Do.
726	....do	....do	49,000	99,800	....do	Do.
740	....do	Middle	46,000	82,720	....do	Muzzle end, additional specimen.

10-INCH STEEL B. L. RIFLE.

STEEL SPECIMENS FROM TUBE, JACKET, HOOPS, BREECH BLOCK, BUSHING RING, GAS-CHECK RING, FACE PLATE, SPINDLE, SECURING PIN, AND HINGE PIN.

No. 3367.

Marks, $\begin{smallmatrix}10\ R_1\ J \\ B\ T_3\ O\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001143	.000200	....	....	
9, 000	36, 000	.001167	.000034	....	....	
9, 250	37, 000	.001200	.000033	....	....	
9, 500	38, 000	.001233	.000033	....	....	
9, 750	39, 000	.001267	.000034	....	....	
10, 000	40, 000	.001333	.000066	....	....	
10, 250	41, 000	.001367	.000034	....	....	
10, 500	42, 000	.001400	.000033	....	....	
10, 750	43, 000	.001433	.000033	....	....	
11, 000	44, 000	.001500	.000067	....	....	
11, 250	45, 000	.001533	.000033	....	....	
11, 500	46, 000	.001600	.000067	....	....	
11, 750	47, 000	.001667	.000067	....	....	Elastic limit not well defined.
12, 000	48, 000	.001767	.000100	....	....	
12, 250	49, 000	.001833	.000066	....	....	
12, 500	50, 000	.002033	.000200	....	....	
12, 750	51, 000	.002300	.000267	....	....	
13, 000	52, 000	.002533	.000233	....	....	
13, 250	53, 000	.002933	.000400	....	....	
13, 500	54, 000	.003667	.000734	....	....	
13, 750	55, 000	.004433	.000766	....	....	
14, 000	56, 000	.005500	.001067	....	....	
14, 250	57, 000	.006333	.000833	....	....	
14, 500	58, 000	.007333	.001000	....	....	
14, 750	59, 000	.008167	.000834	....	....	
15, 000	60, 000	.009333	.001166	....	....	
15, 500	62, 000	.011333	.002000	....	....	
16, 000	64, 000	.013333	.002000	....	....	
16, 500	66, 000	.015433	.002100	....	....	
17, 000	68, 000	.017500	.002067	....	....	
17, 500	70, 000	.019833	.002333	....	....	
18, 000	72, 000	.022533	.002700	....	....	
18, 500	74, 000	.024933	.002400	....	....	
19, 000	76, 000	.027833	.002900	....	....	
19, 500	78, 000	.031000	.003167	....	....	
20, 000	80, 000	.034533	.003533	....	....	
20. 500	82, 000	.038667	.004134	....	....	
21, 000	84, 000	.043333	.004666	....	....	
21, 500	86, 000	.049000	.005667	....	....	
22, 000	88, 000	.0567	.0077	....	....	
22 500	90, 000	.0667	.0100	....	....	
23, 000	92, 000	.0800	.0133	....	....	
23, 270	93, 080	.1133	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.................pounds.. 93,080
Elastic limit per square inch of original section (not well defined)..........do.... 47,000
Elongation per inch after rupture..........................inch.. 0.2000
Elongation per inch under strain at elastic limit....................do.... .001667
Reduction in diameter at point of rupture......................do.... .144
Reduction in area after rupture, per centum of original section.................. 44.6
Position of rupture..″.95 from neck
Character of broken surface...silky
Elongation of inch sections..............................″.22*, ″.17, ″.11

No. 3368.

Marks, $\begin{smallmatrix}10\ \text{R, J}\\ \text{B T, M}\end{smallmatrix}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.001000	.000200	0.	....	
8,750	35,000	.001200	.000200	....	....	
9,000	36,000	.001267	.000067	....	....	
9,250	37,000	.001333	.000066	....	....	
9,500	38,000	.001400	.000067	....	....	
9,750	39,000	.001433	.000033	....	....	Elastic limit.
10,000	40,000	.001567	.000134	....	....	
10,250	41,000	.001700	.000133	....	....	
10,500	42,000	.001833	.000133	....	....	
10,750	43,000	.002033	.000200	....	....	
11,000	44,000	.002333	.000300	....	....	
11,250	45,000	.002700	.000367	....	....	
11,500	46,000	.003333	.000633	....	....	
11,750	47,000	.003767	.000434	....	....	
12,000	48,000	.004567	.000800	....	....	
12,250	49,000	.005333	.000766	....	....	
12,500	50,000	.006367	.001034	....	....	
12,750	51,000	.007233	.000866	....	....	
13,000	52,000	.008000	.000767	....	....	
13,250	53,000	.009000	.001000	....	....	
13,500	54,000	.010167	.001167	....	....	
13,750	55,000	.010667	.000500	....	....	
14,000	56,000	.011333	.000666	....	....	
14,250	57,000	.012667	.001334	....	....	
14,500	58,000	.013667	.001000	....	....	
14,750	59,000	.015000	.001333	....	....	
15,000	60,000	.016333	.001333	....	....	
15,500	62,000	.017833	.001500	....	....	
16,000	64,000	.019167	.001334	....	....	
16,500	66,000	.022333	.003166	....	....	
17,000	68,000	.024833	.002500	....	....	
17,500	70,000	.027400	.002567	....	....	
18,000	72,000	.030567	.003167	....	....	
18,500	74,000	.033900	.003333	....	....	
19,000	76,000	.038667	.004767	....	....	
19,500	78,000	.042500	.003833	....	....	
20,000	80,000	.047467	.004967	....	....	
20,500	82,000	.0567	.009233	....	....	
21,000	84,000	.0633	.0066	....	....	
21,500	86,000	.0733	.0100	....	....	
22,000	88,000	.0967	.0234	....	....	
22,120	88,480	.1233	.0266	....	....	Tensile strength.

General summary.

Specific gravity		7.8680
Hardness		17.08
Tensile strength per square inch of original section	pounds	88,480
Elastic limit per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.1800
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.25, ″.17, ″.11

No. 3369.

Marks, $^{10\,E,\,J}_{B\,T_4\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000500	.000200	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000867	.000200	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	....	....	
9,000	36,000	.001267	.000067	....	....	
9,250	37,000	.001333	.000066	....	....	
9,500	38,000	.001400	.000067	....	....	
9,750	39,000	.001467	.000067	....	....	Elastic limit.
10,000	40,000	.001600	.000133	....	....	
10,250	41,000	.001767	.000167	....	....	
10,500	42,000	.001933	.000166	....	....	
10,750	43,000	.002167	.000234	....	....	
11,000	44,000	.002500	.000333	....	....	
11,250	45,000	.002833	.000333	....	....	
11,500	46,000	.003367	.000534	....	....	
11,750	47,000	.004000	.000633	....	....	
12,000	48,000	.004733	.000733	....	....	
12,250	49,000	.005433	.000700	....	....	
12,500	50,000	.006333	.000900	....	....	
12,750	51,000	.007000	.000667	....	....	
13,000	52,000	.008000	.001000	....	....	
13,250	53,000	.008833	.000833	....	....	
13,500	54,000	.009867	.001034	....	....	
13,750	55,000	.011000	.001133	....	....	
14,000	56,000	.011833	.000833	....	....	
14,250	57,000	.012600	.000767	....	....	
14,500	58,000	.013600	.001000	....	....	
14,750	59,000	.014567	.000967	....	....	
15,000	60,000	.015733	.001166	....	....	
15,500	62,000	.017767	.001034	....	....	
16,000	64,000	.020167	.002400	....	....	
16,500	66,000	.022667	.002500	....	....	
17,000	68,000	.025167	.002500	....	....	
17,500	70,000	.028333	.003166	....	....	
18,000	72,000	.031233	.002900	....	....	
18,500	74,000	.035000	.003767	....	....	
19,000	76,000	.038567	.003567	....	....	
19,500	78,000	.043200	.004633	....	....	
20,000	80,000	.048333	.005133	....	....	
20,500	82,000	.0533	.004967	....	....	
21,000	84,000	.0633	.0100	....	....	
21,500	86,000	.0733	.0100	....	....	
22,000	88,000	.0967	.0184	....	....	
22,200	88,800	.1300	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	88,800
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.2067
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.1
Position of rupture		1″.5 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.35*, ″.13

No. 3370.

Marks, $\overset{10\ R_1\ J}{B\ R_6}$
Diameter, ″.560.
Sectional area, .246 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
246	1, 000	0.	0.	0.	0.	Initial load.
1, 230	5, 000	.000133	.000133	0.		
2, 460	10, 000	.000333	.000200	0.		
3, 690	15, 000	.000500	.000167	0.		
4, 920	20, 000	.000667	.000167	0.		
6, 150	25, 000	.000833	.000166	0.		
7, 380	30, 000	.001033	.000200	0.		
8, 610	35, 000	.001233	.000200			
8, 856	36, 000	.001300	.000067			
9, 102	37, 000	.001367	.000067			
9, 348	38, 000	.001467	.000100			
9, 594	39, 000	.001533	.000068			Elastic limit.
9, 840	40, 000	.001667	.000134			
10, 086	41, 000	.001800	.000033			
10, 332	42, 000	.001967	.000167			
10, 578	43, 000	.002167	.000200			
10, 824	44, 000	.002433	.000266			
11, 070	45, 000	.002767	.000334			
11, 316	46, 000	.003167	.000400			
11, 562	47, 000	.003667	.000500			
11, 808	48, 000	.004267	.000600			
12, 054	49, 000	.004767	.000500			
12, 300	50, 000	.005700	.000933			
12, 546	51, 000	.006500	.000800			
12, 792	52, 000	.007200	.000700			
13, 038	53, 000	.008267	.001067			
13, 284	54, 000	.009300	.001033			
13, 530	55, 000	.009967	.000667			
13, 776	56, 000	.010867	.000900			
14, 022	57, 000	.011667	.000800			
14, 268	58, 000	.012567	.000900			
14, 514	59, 000	.013700	.001133			
14, 760	60, 000	.014733	.001033			
15, 252	62, 000	.016533	.001800			
15, 744	64, 000	.018833	.002300			
16, 236	66, 000	.021167	.002334			
16, 728	68, 000	.023900	.002733			
17, 220	70, 000	.027067	.003167			
17, 712	72, 000	.029433	.002366			
18, 204	74, 000	.033167	.003734			
18, 696	76, 000	.037167	.004000			
19, 188	78, 000	.041667	.004500			
19, 680	80, 000	.046600	.004933			
20, 172	82, 000	.053000	.006400			
20, 664	84, 000	.0633	.0103			
21, 156	86, 000	.0700	.0067			
21, 648	88, 000	.0867	.0167			
21, 960	89, 270	.1233	.0366			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	89, 270
Elastic limit per square inch of original section	do ...	39, 000
Elongation per inch after rupture	inch..	0. 1800
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.140
Reduction in area after rupture, per centum of original section		43. 7
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.08, ″.12, ″24

No. 751.

Marks, $\overset{10\ R_1\ J}{B\ R_s}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000400	.000133	0.	....	
10,000	20,000	.000567	.000167	0.	....	
12,500	25,000	.000733	.000166	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001067	.000167	....	....	
18,000	36,000	.001100	.000033	....	....	
18,500	37,000	.001133	.000033	....	....	
19,000	38,000	.001167	.000034	....	....	
19,500	39,000	.001200	.000033	....	....	
20,000	40,000	.001267	.000067	....	....	Elastic limit.
20,500	41,000	.001367	.000100	....	....	
21,000	42,000	.001467	.000100	....	....	
21,500	43,000	.001700	.000233	....	....	
22,000	44,000	.001967	.000267	....	....	
22,500	45,000	.002267	.000300	....	....	
23,000	46,000	.002667	.000400	....	....	
23,500	47,000	.003133	.000466	....	....	
24,000	48,000	.003800	.000667	....	....	
24,500	49,000	.004433	.000633	....	....	
25,000	50,000	.005000	.000567	....	....	
25,500	51,000	.006000	.001000	....	....	
26,000	52,000	.006933	.000933	....	....	
42,480	84,960	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 752.

Marks, $^{10\,R_1\,J}_{\ B\ R_1}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000733	.000133	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001100	.000200	....	....	
18,000	36,000	.001133	.000033	....	....	
18,500	37,000	.001167	.000034	....	....	
19,000	38,000	.001233	.000066	....	....	Elastic limit.
19,500	39,000	.001367	.000134	....	....	
20,000	40,000	.001533	.000166	....	....	
20,500	41,000	.001733	.000200	....	....	
21,000	42,000	.002033	.000300	....	....	
21,500	43,000	.002333	.000300	....	....	
22,000	44,000	.002667	.000334	....	....	
22,500	45,000	.003167	.000500	....	....	
23,000	46,000	.003667	.000500	....	....	
23,500	47,000	.004267	.000600	....	....	
24,000	48,000	.004833	.000566	....	....	
24,500	49,000	.005467	.000634	....	....	
25,000	50,000	.006167	.000700	....	....	
25,500	51,000	.006800	.000633	....	....	
26,000	52,000	.007533	.000733	....	....	
41,900	83,800	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 753.

Marks, $\overset{10\ B_1\ J}{B\ T_2\ I}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	000166	0.	....	
17,500	35,000	.001100	000167	....	....	
20,000	40,000	.001267	.000167	....	....	
22,500	45,000	.001500	.000233	....	....	
23,000	46,000	.001533	.000033	....	....	
23,500	47,000	.001600	.000067	....	....	
24,000	48,000	.001667	.000067	....	....	
24,500	49,000	.001700	.000033	....	....	
25,000	50,000	.001733	.000033	....	....	
25,500	51,000	.001767	.000034	....	....	
26,000	52,000	.001833	.000066	....	....	
26,500	53,000	.001900	.000067	....	....	
27,000	54,000	.001967	.000067	....	....	Elastic limit.
27,500	55,000	.002067	.000100	....	....	
28,000	56,000	.002200	.000133	....	....	
28,500	57,000	.002333	.000133	....	....	
29,000	58,000	.002500	.000167	....	....	
29,500	59 000	.002667	.000167	....	....	
30,000	60,000	.003000	.000333	....	....	
30,500	61,000	.003333	.000333	....	....	
31,000	62,000	.003733	.000400	....	....	
31,500	63,000	.004100	.000367	....	....	
32,000	64,000	.004500	.000400	....	....	
32,500	65,000	.004933	.000433	....	....	
33,000	66,000	.005500	.000567	....	....	
33,500	67,000	.005900	.000400	....	....	
34,000	68,000	.006400	.000500	....	....	
34,500	69.000	.006933	.000533	....	....	
35,000	70,000	.007333	.000400	....	....	
42,800	84,600	....	....	....	....	Ultimate strength.

Failed by triple flexure

No. 754.

Marks, $^{10\ R,\ J}_{B\ T,\ O}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*ounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	0.	....	
20,000	40,000	.001267	.000167	0.	....	
22,500	45,000	.001467	.000200	....	....	
23,000	46,000	.001500	.000033	....	....	
23,500	47,000	.001533	.000033	....	....	Elastic limit.
24,000	48,000	.001633	.000100	....	....	
24,500	49,000	.001733	.000100	....	....	
25,000	50,000	.001800	.000067	....	....	
25,500	51,000	.001933	.000133	....	....	
26,000	52,000	.002067	.000134	....	....	
26,500	53,000	.002267	.000200	....	....	
27,000	54,000	.002633	.000366	....	....	
27,500	55,000	.003100	.000467	....	....	
28,000	56,000	.003533	.000433	....	....	
28,500	57,000	.004267	.000734	....	....	
29,000	58,000	.005000	.000733	....	....	
29,500	59,000	.005833	.000833	....	....	
30,000	60,000	.006667	.000834	....	....	
42,920	85,840	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 755.

Marks, $\frac{10\ R,\ J}{B\ T_{10}\ M}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

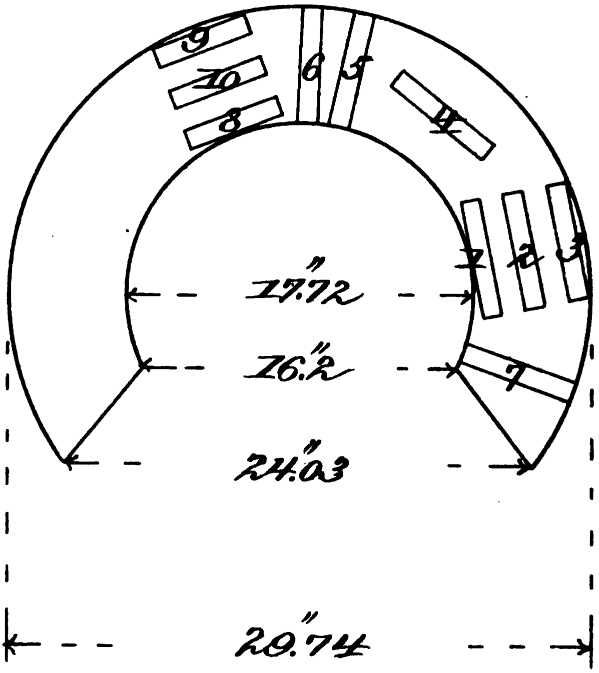
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000733	.000133	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001100	.000200	.000033	.000033	
18,000	36,000	.001167	.000067	....	....	
18,500	37,000	.001200	.000033	....	....	
19,000	38,000	.001267	.000067	....	....	Elastic limit.
19,500	39,000	.001367	.000100	....	....	
20,000	40,000	.001500	.000133	....	....	
20,500	41,000	.001667	.000167	....	....	
21,000	42,000	.001867	.000200	....	....	
21,500	43,000	.002133	.000266	....	....	
22,000	44,000	.002500	.000367	....	....	
22,500	45,000	.002833	.000333	....	....	
23,000	46,000	.003333	.000500	....	....	
23,500	47,000	.003967	.000634	....	....	
24,000	48,000	.004500	.000533	....	....	
24,500	49,000	.005167	.000667	....	....	
25,000	50,000	.006000	.000833	....	....	
25,500	51,000	.006667	.000667	....	....	
26,000	52,000	.007567	.000900	....	....	
41,480	82,960	....	....	....	....	Ultimate strength.

Failed by triple flexure.

10 inch steel B. L. Rifle

Jacket, Whitworth steel

Muzzle



No. 3377.

Marks, $^{10\ R_1\ J}_{M\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	....	....	
10,000	40,000	.001333	.000166	....	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001467	.000067	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001567	.000067	....	....	
11,500	46,000	.001600	.000033	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001667	.000034	....	....	
12,250	49,000	.001700	.000033	....	....	
12,500	50,000	.001767	.000067	....	....	Elastic limit.
12,750	51,000	.001967	.000200	....	....	
13,000	52,000	.007367	.005400	....	....	
13,250	53,000	.007867	.000500	....	....	
13,500	54,000	.008800	.000933	....	....	
13,750	55,000	.009333	.000533	....	....	
14,000	56,000	.010267	.000934	....	....	
14,250	57,000	.011567	.001300	....	....	
14,500	58,000	.012500	.000933	....	....	
14,750	59,000	.013333	.000833	....	....	
15,000	60,000	.014167	.000834	....	....	
15,500	62,000	.015833	.001666	....	....	
16,000	64,000	.017700	.001867	....	....	
16,500	66,000	.019933	.002233	....	....	
17,000	68,000	.022067	.002134	....	....	
17,500	70,000	.024500	.002433	....	....	
18,000	72,000	.027333	.002833	....	....	
18,500	74,000	.030000	.002667	....	....	
19,000	76,000	.033333	.003333	....	....	
19,500	78,000	.036667	.003334	....	....	
20,000	80,000	.040667	.004000	....	....	
20,500	82,000	.045600	.004933	....	....	
21,000	84,000	.051500	.005900	....	....	
21,500	86,000	.0567	.0052	....	....	
22,000	88,000	.0667	.0100	....	....	
22,500	90,000	.0800	.0133	....	....	
22,970	91,880	.1267	.0467	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91,880
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do ...	.001767
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.45 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.35*, ″.11

No. 3378.

Marks, $\frac{\text{10 R, J}}{\text{M T, M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	....	....	
10, 250	41, 000	.001367	.000034	....	....	
10, 500	42, 000	.001433	.000066	....	....	
10, 750	43, 000	.001500	.000067	....	....	
11, 000	44, 000	.001533	.000033	....	....	
11, 250	45, 000	.001567	.000034	....	....	
11, 500	46, 000	.001633	.000066	....	....	
11, 750	47, 000	.001700	.000067	....	....	Elastic limit.
12, 000	48, 000	.007467	.005767	....	....	
12, 250	49, 000	.008000	.000533	....	....	
12, 500	50, 000	.008833	.000833	....	....	
12, 750	51, 000	.009433	.000600	....	....	
13, 000	52, 000	.010500	.001067	....	....	
13, 250	53, 000	.011333	.000833	....	....	
13, 500	54, 000	.012267	.000934	....	....	
13, 750	55, 000	.013100	.000833	....	....	
14, 000	56, 000	.014067	.000967	....	....	
14, 250	57, 000	.015233	.001166	....	....	
14, 500	58, 000	.016167	.000934	....	....	
14, 750	59, 000	.017233	.001066	....	....	
15, 000	60, 000	.018267	.001034	....	....	
15, 500	62, 000	.020233	.001966	....	....	
16, 000	64, 000	.022733	.002500	....	....	
16, 500	66, 000	.025600	.002867	....	....	
17, 000	68, 000	.028000	.002400	....	....	
17, 500	70, 000	.031167	.003167	....	....	
18, 000	72, 000	.034567	.003400	....	....	
18, 500	74, 000	.038433	.003866	....	....	
19, 000	76, 900	.042667	.004234	....	....	
19, 500	78, 000	.047500	.004833	....	....	
20, 000	80, 000	.0567	.0092	....	....	
20, 500	82, 000	.0633	.0066	....	....	
21, 000	84, 000	.0700	.0067	....	....	
21, 500	86, 000	.0867	.0167	....	....	
22, 000	88, 000	.1233	.0366	....	....	
22, 060	88, 240	.1433	.0200	....	....	Tensile strength.

General summary.

Specific gravity	7. 8642
Hardness	15. 59
Tensile strength per square inch of original section....pounds..	88, 240
Elastic limit per square inch of original section....do ...	47, 000
Elongation per inch after rupture....inch..	0. 2300
Elongation per inch under strain at elastic limit....do....	.001700
Reduction in diameter at point of rupture....do....	.154
Reduction in area after rupture, per centum of originals ection	47. 2
Position of rupture	1".35 from neck
Character of broken surface	silky
Elongation of inch sections	".13, ".31*, ".25

No. 3379.

Marks, $^{10\ R,\ J}_{M\ T,\ O}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	....	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001500	.000067	....	....	
11,250	45,000	.001533	.000033	....	....	
11,500	46,000	.001567	.000034	....	....	
11,750	47,000	.001600	.000033	....	....	
12,000	48,000	.001667	.000067	....	....	Elastic limit.
12,250	49,000	.009600	.007933	....	....	
12,500	50,000	.010100	.000500	....	....	
12,750	51,000	.010833	.000733	....	....	
13,000	52,000	.011800	.000967	....	....	
13,250	53,000	.012667	.000867	....	....	
13,500	54,000	.013567	.000900	....	....	
13,750	55,000	.014500	.000933	....	....	
14,000	56,000	.015667	.001167	....	....	
14,250	57,000	.016667	.001000	....	....	
14,500	58,000	.017833	.001166	....	....	
14,750	59,000	.019167	.001334	....	....	
15,000	60,000	.020167	.001000	....	....	
15,500	62,000	.022667	.002500	....	....	
16,000	64,000	.025467	.002800	....	....	
16,500	66,000	.028367	.002900	....	....	
17,000	68,000	.031733	.003366	....	....	
17,500	70,000	.036667	.004934	....	....	
18,000	72,000	.040000	.003333	....	....	
18,500	74,000	.044333	.004333	....	....	
19,000	76,000	.050667	.006334	....	....	
19,500	78,000	.057500	.006833	....	....	
20,000	80,000	.068333	.010833	....	....	
20,500	82,000	.0800	.011667	....	....	
21,000	84,000	.1033	.0233	....	....	
21,200	84,800	.1400	.0367	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	84,800
Elastic limit per square inch of original section	do ...	48,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		''.80 from neck
Character of broken surface		silky
Elongation of inch sections		''.42*, ''.15, ''.11

No. 3380.

Marks, $^{10\ B,\ J}_{M\ T_4\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001300	.000133	....	....	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001433	.000066	....	....	
11,000	44,000	.001467	.000034	....	....	
11,250	45,000	.001500	.000033	....	....	
11,500	46,000	.001567	.000067	....	....	Elastic limit.
11,750	47,000	.008500	.006933	....	....	
12,000	48,000	.008900	.000400	....	....	
12,250	49,000	.009333	.000433	....	....	
12,500	50,000	.010233	.000900	....	....	
12,750	51,000	.011167	.000934	....	....	
13,000	52,000	.012033	.000866	....	....	
13,250	53,000	.013000	.000967	....	....	
13,500	54,000	.013833	.000833	....	....	
13,750	55,000	.014700	.000867	....	....	
14,000	56,000	.015733	.001033	....	....	
14,250	57,000	.016700	.000967	....	....	
14,500	58,000	.017867	.001167	....	....	
14,750	59,000	.018867	.001000	....	....	
15,000	60,000	.020167	.001300	....	....	
15,500	62,000	.022667	.002500	....	....	
16,000	64,000	.025267	.002600	....	....	
16,500	66,000	.028167	.002900	....	....	
17,000	68,000	.031367	.003200	....	....	
17,500	70,000	.035000	.003633	....	....	
18,000	72,000	.038833	.003833	....	....	
18,500	74,000	.044000	.005167	....	....	
19,000	76,000	.049167	.005167	....	....	
19,500	78,000	.0567	.007533	....	....	
20,000	80,000	.0633	.0066	....	....	
20,500	82,000	.0733	.0100	....	....	
21,000	84,000	.0967	.0184	....	....	
21,490	85,960	.1633	.0666	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	85,960
Elastic limit per square inch of original section	do....	46,000
Elongation per inch after rupture	inch..	0.2367
Elongation per inch under strain at elastic limit	do ...	.001567
Reduction in diameter at point of rupture	do ...	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1" from neck
Character of broken surface		silky
Elongation of inch sections		".36*, ".21, ".14

No. 3381.

Marks, $\overset{10\ R_1\ J}{M\ R_2}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000500	.000200	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	....	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001500	.000067	....	....	
11,250	45,000	.001533	.000033	....	....	Elastic limit.
11,500	46,000	.001633	.000100	....	....	
11,750	47,000	.003267	.001634	....	....	
12,000	48,000	.007667	.004400	....	....	
12,250	49,000	.008567	.000900	....	....	
12,500	50,000	.009400	.000833	....	....	
12,750	51,000	.010067	.000667	....	....	
13,000	52,000	.011000	.000933	....	....	
13,250	53,000	.011833	.000833	....	....	
13,500	54,000	.012767	.000934	....	....	
13,750	55,000	.013733	.000966	....	....	
14,000	56,000	.014567	.000834	....	....	
14,250	57,000	.015333	.000766	....	....	
14,500	58,000	.016500	.001167	....	....	
14,750	59,000	.017667	.001167	....	....	
15,000	60,000	.019033	.001366	....	....	
15,500	62,000	.021100	.002067	....	....	
16,000	64,000	.023500	.002400	....	....	
16,500	66,000	.026000	.002500	....	....	
17,000	68,000	.029000	.003000	....	....	
17,500	70,000	.032167	.003167	....	....	
18,000	72,000	.036000	.003833	....	....	
18,500	74,000	.039500	.003500	....	....	
19,000	76,000	.044333	.004833	....	....	
19,500	78,000	.049833	.005500	....	....	
20,000	80,000	.0567	.006867	....	....	
20,500	82,000	.0633	.0066	....	....	
21,000	84,000	.0733	.0100	....	....	
21,500	86,000	.0967	.0234	....	....	
21,840	87,360	.1400	.0433	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	87,360
Elastic limit per square inch of original section	do	45,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do.....	.001533
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.28 from neck
Character of broken surface		silky
Elongation of inch sections		″.28*, ″.28*, ″.12

No. 756.

Marks, $\frac{10\text{ R, J}}{\text{M R.}}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	0.	....	
15,000	30,000	.000933	.000166	0.	....	
17,500	35,000	.001100	.000167	.000033	.000033	
18,000	36,000	.001133	.000023	....	....	
18,500	37,000	.001167	.000034	....	....	
19,000	38,000	.001200	.000033	....	....	
19,500	39,000	.001233	.000033	....	....	
20,000	40,000	.001267	.000034	....	....	
20,500	41,000	.001267	0.	....	....	
21,000	42,000	.001333	.000066	....	....	
21,500	43,000	.001333	0.	....	....	
22,000	44,000	.001367	.000034	....	....	
22,500	45,000	.001400	.000033	....	....	
23,000	46,000	.001433	.000033	....	....	
23,500	47,000	.001433	0.	....	....	
24,000	48,000	.001400	−.000033	....	....	Elastic limit.
24,500	49,000	.003233	.001833	....	....	
25,000	50,000	.007100	.003867	....	....	
25,500	51,000	.007433	.000333	....	....	
26,000	52,000	.007900	.000467	....	....	
40,680	81,360	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 757.

Marks, $\frac{10\ \text{R. J}}{\text{M R.}}$
Length, 5".
Diameter, ".798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000400	.000133	0.	....	
10,000	20,000	.000567	.000167	0.	....	
12,500	25,000	.000733	.000166	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001067	.000167	0.	....	
20,000	40,000	.001233	.000166	....	....	
20,500	41,000	.001267	.000034	....	....	
21,000	42,000	.001300	.000033	....	....	
21,500	43,000	.001333	.000033	....	....	
22,000	44,000	.001367	.000034	....	....	
22,500	45,000	.001400	.000033	....	....	
23,000	46,000	.001433	.000033	....	....	
23,500	47,000	.001533	.000110	....	....	Elastic limit.
24 000	48,000	.003933	.002400	....	....	
24,500	49,000	.004933	.001000	....	....	
25,000	50,000	.005433	.000500	....	....	
25,500	51,000	.006167	.000734	....	....	
26,000	52,000	.006933	.000766	....	....	
41,420	82,840	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 758.

Marks, $\substack{10\ \mathrm{R,\ J}\\ \mathrm{M\ T,\ I}}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000300	.000200	0.	....	
7,500	15,000	.000467	.000167	0.	....	
10,000	20,000	.000633	.000166	0.	....	
12,500	25,000	.000800	.000167	0.	....	
15,000	30,000	.000967	.000167	0.	....	
17,500	35,000	.001167	.000200	.000067	.000067	
20,000	40,000	.001333	.000166	....	....	
20,500	41,000	.001367	.000034	....	....	
21,000	42,000	.001400	.000033	....	....	
21,500	43,000	.001467	.000067	....	....	
22,000	44,000	.001500	.000033	....	....	
22,500	45,000	.001533	.000033	....	....	
23,000	46,000	.001567	.000034	....	....	
23,500	47,000	.001600	.000033	....	....	
24,000	48,000	.001633	.000033	....	....	
24,500	49,000	.001667	.000034	....	....	
25,000	50,000	.001700	.000033	....	....	
25,500	51,000	.001733	.000033	....	....	
26,000	52,000	.001767	.000034	....	....	Elastic limit.
26,500	53,000	.002100	.000333	....	....	
27,000	54,000	.004833	.002733	....	....	
27,500	55,000	.006400	.001567	....	....	
28,000	56,000	.007333	.000933	....	....	
41,750	83,500	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 759.

Marks, $\begin{smallmatrix}10\ R_1\ J\\ M\ T_1\ O\end{smallmatrix}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.		
5,000	10,000	.000267	.000167	0.		
7,500	15,000	.000433	.000166	0.		
10,000	20,000	.000600	.000167	0.		
12,500	25,000	.000767	.000167	0.		
15,000	30,000	.000933	.000166	0.		
17,500	35,000	.001100	.000167	0.		
20,000	40,000	.001300	.000200			
20,500	41,000	.001367	.000067			
21,000	42,000	.001400	.000033			
21,500	43,000	.001433	.000033			
22,000	44,000	.001467	.000034			
22,500	45,000	.001500	.000033			
23,000	46,000	.001567	.000067			
23,500	47,000	.001600	.000033			Elastic limit.
24,000	48,000	.001700	.000100			
24,500	49,000	.002533	.000833			
25,000	50,000	.004167	.001634			
25,500	51,000	.005667	.001500			
26,000	52,000	.006067	.000400			
26,500	53,000	.006800	.000733			
40,970	81,940	.007400	.000600			Ultimate strength.

Failed by triple flexure.

No. 760.

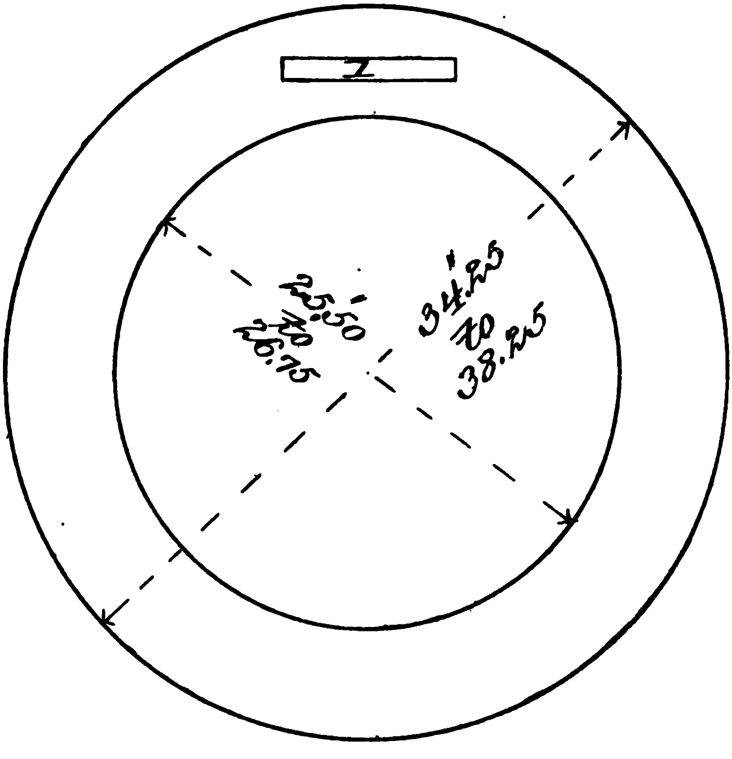
Marks, $\substack{10\ R_1\ J\\ M\ T_{18}\ M}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000233	.000166	0.	....	
7,500	15,000	.000400	.000167	0.	....	
10,000	20,000	.000567	.000167	0.	....	
12,500	25,000	.000733	.000166	0.	....	
15,000	30,000	.000900	.000167	0.	....	
17,500	35,000	.001067	.000167	0.	....	
20,000	40,000	.001233	.000166	....	....	
20,500	41,000	.001267	.000034	....	....	
21,000	42,000	.001300	.000033	....	....	
21,500	43,000	.001333	.000033	....	....	
22,000	44,000	.001367	.000034	....	....	
22,500	45,000	.001367	0.	....	....	Elastic limit.
23,000	46,000	.001767	.000400	....	....	
23,500	47,000	.006133	.004366	....	....	
24,000	48,000	.006500	.000367	....	....	
24,500	49,000	.007167	.000667	....	....	
25,000	50,000	.007867	.000700	....	....	
40,820	81,640	....	....	....	....	Ultimate strength.

Failed by triple flexure.

10 inch Steel B. L. Rifle

A Hoops



A HOOPS.

No. 2811.

Marks, $^{10}{}^{R_1A_1}_{T_1M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000267	.000184	0.	....	
3,750	15,000	.000417	.000150	0.	....	
5,000	20,000	.000583	.000166	0.	....	
6,250	25,000	.000733	.000150	0.	....	
7,500	30,000	.000917	.000184	0.	....	
8,750	35,000	.001083	.000166	0.	....	
10,000	40,000	.001267	.000184	0.	....	
11,250	45,000	.001417	.000150	....	....	
12,500	50,000	.001600	.000183	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001750	.000050	....	....	
13,750	55,000	.001783	.000033	....	....	
14,000	56,000	.001850	.000067	....	....	
14,250	57,000	.001900	.000050	....	....	Elastic limit.
14,500	58,000	.002000	.000100	....	....	
14,750	59,000	.002183	.000183	....	....	
15,000	60,000	.002517	.000334	....	....	
15,500	62,000	.003333	.000816	....	....	
16,000	64,000	.004333	.001000	....	....	
16,500	66,000	.005583	.001250	....	....	
17,000	68,000	.007000	.001417	....	....	
17,500	70,000	.008500	.001500	....	....	
18,000	72,000	.010000	.001500	....	....	
18,500	74,000	.011500	.001500	....	....	
19,000	76,000	.013000	.001500	....	....	
19,500	78,000	.014667	.061667	....	....	
20,000	80,000	.016333	.001666	....	....	
20,500	82,000	.018167	.001834	....	....	
21,000	84,000	.020000	.001833	....	....	
21,500	86,000	.021833	.001833	....	....	
22,000	88,000	.024000	.002167	....	....	
22,500	90,000	.026167	.002167	....	....	
23,000	92,000	.028500	.002333	....	....	
23,500	94,000	.031000	.002500	....	....	
24,000	96,000	.0350	.0040	....	....	
24,500	98,000	.0383	.0033	....	....	
25,000	100,000	.0417	.0034	....	....	
25,500	102,000	.0450	.0033	....	....	
26,000	104,000	.0517	.0067	....	....	
26,500	106,000	.0583	.0066	....	....	
27,000	108,000	.0683	.0100	....	....	
27,500	110,000	.0917	.0234	....	....	
27,510	110,040	.1017	.0100	....	....	Tensile strength.

General summary.

Specific gravity	7.8418
Hardness	24.26
Tensile strength per square inch of original section ... pounds..	110,040
Elastic limit per square inch of original section ... do....	57,000
Elongation per inch after rupture ... inch..	0.1267
Elongation per inch under strain at elastic limit ... do....	.001900
Reduction in diameter at point of rupture ... do....	.104
Reduction in area after rupture, per centum of original section	33.5
Position of rupture	1″.6 from neck
Character of broken surface	silky; slightly granular at the circumference
Elongation of inch sections	″.11, ″.28*, ″.12, ″.10, ″.08, ″.07

No. 2797.

Marks, $^{10}\overset{R_1A_3}{T_4 I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000633	.000183	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001700	.000050	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001933	.000033	....	....	
14,750	59,000	.001967	.000034	....	....	Elastic limit.
15,000	60,000	.002133	.000166	....	....	
15,250	61,000	.008333	.006200	....	....	
15,500	62,000	.009167	.000834	....	....	
16,000	64,000	.010833	.001666	....	....	
16,500	66,000	.012500	.001667	....	....	
17,000	68,000	.014167	.001667	....	....	
17,500	70,000	.016000	.001833	....	....	
18,000	72,000	.017667	.001667	....	....	
18,500	74,000	.019667	.002000	....	....	
19,000	76,000	.021667	.002000	....	....	
19,500	78,000	.024167	.002500	....	....	
20,000	80,000	.026500	.002333	....	....	
20,500	82,000	.0300	.0035	....	....	
21,000	84,000	.0333	.0033	....	....	
21,500	86,000	.0367	.0034	....	....	
22,000	88,000	.0400	.0033	....	....	
22,500	90,000	.0433	.0033	....	....	
23,000	92,000	.0500	.0067	....	....	
23,500	94,000	.0567	.0067	....	....	
24,000	96,000	.0633	.0066	....	....	
24,500	98,000	.0750	.0117	....	....	
25,000	100,000	.0933	.0183	....	....	
25,150	100,600	.1333	.0400	....	....	Tensile strength.

General summary.

Specific gravity	7.8409
Hardness	28.70
Tensile strength per square inch of original section....pounds	100,600
Elastic limit per square inch of original section....do	59,000
Elongation per inch after rupture....inch	0.1700
Elongation per inch under strain at elastic limit....do	.001967
Reduction in diameter at point of rupture....do	.154
Reduction in area after rupture, per centum of original section	47.2
Position of rupture	1".4 from neck
Character of broken surface	fine silky
Elongation of inch sections	".12, ".15, ".11, ".12, ".21*, ".30

No. 2812.

Marks, $\substack{^{10}R_1A_3 \\ T_1M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	....	....	
2,500	10,000	.000283	.000166	....	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	....	....	
6,250	25,000	.000783	.000166	....	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001117	.000167	....	....	
10,000	40,000	.001283	.000166	.000017	.000017	
11,250	45,000	.001467	.000184	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.004650	.000017	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001767	.000084	....	....	
13,500	54,000	.001783	.000016	....	....	Elastic limit.
13,750	55,000	.001950	.000167	....	....	
14,000	56,000	.003300	.001350	....	....	
14,250	57,000	.003967	.000667	....	....	
14,500	58,000	.004533	.000566	....	....	
14,750	59,000	.005083	.000550	....	....	
15,000	60,000	.005600	.000517	....	....	
15,500	62,000	.007017	.001417	....	....	
16,000	64,000	.008633	.001616	....	....	
16,500	66,000	.010250	.001617	....	....	
17,000	68,000	.012050	.001800	....	....	
17,500	70,000	.013633	.001583	....	....	
18,000	72,000	.015383	.001750	....	....	
18,500	74,000	.017867	.002484	....	....	
19,000	76,000	.019450	.001583	....	....	
19,500	78,000	.021567	.002117	....	....	
20,000	80,000	.024500	.002933	....	....	
20,500	82,000	.026417	.001917	....	....	
21,000	84,000	.029183	.002766	....	....	
21,500	86,000	.032750	.003567	....	....	
22,000	88,000	.035833	.003083	....	....	
22,500	90,000	.0383	.002467	....	....	
23,000	92,000	.0450	.0067	....	....	
23,500	94,000	.0517	.0067	....	....	
24,000	96,000	.0583	.0066	....	....	
24,500	98,000	.0667	.0084	....	....	
25,000	100,000	.0817	.0150	....	....	
25,500	102,000	.1200	.0383	....	....	Tensile strength.

General summary.

Specific gravity	7.8424
Hardness	22.90
Tensile strength per square inch of original section..pounds..	102,000
Elastic limit per square inch of original section...do....	54,000
Elongation per inch after rupture...inch..	0.1500
Elongation per inch under strain at elastic limit...do....	.001783
Reduction in diameter at point of rupture...do....	.144
Reduction in area after rupture, per centum of original section	44.6
Position of rupture	3" from neck
Character of broken surface	silky
Elongation of inch sections	".09, ".12, ".35*, ".14, ".11, ".09

NEW HOOP.

No. 3003.

Marks, $\overset{10\,R_1\,A_8}{T_4\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001667	.000200	....	....	
12,750	51,000	.001717	.000050	....	....	
13,000	52,000	.001750	.000033	....	....	
13,250	53,000	.001800	.000050	....	....	Elastic limit.
13,500	54,000	.001867	.000067	....	....	
13,750	55,000	.002083	.000216	....	....	
14,000	56,000	.004500	.002417	....	....	
14,250	57,000	.005500	.001000	....	....	
14,500	58,000	.006000	.000500	....	....	
14,750	59,000	.006667	.000667	....	....	
15,000	60,000	.007467	.000800	....	....	
15,500	62,000	.009167	.001700	....	....	
16,000	64,000	.010500	.001333	....	....	
16,500	66,000	.012133	.001633	....	....	
17,000	68,000	.013833	.001700	....	....	
17,500	70,000	.015917	.002084	....	....	
18,000	72,000	.017500	.001583	....	....	
18,500	74,000	.019417	.001917	....	....	
19,000	76,000	.021167	.001750	....	....	
19,500	78,000	.023200	.002033	....	....	
20,000	80,000	.025667	.002467	....	....	
20,500	82,000	.028000	.002333	....	....	
21,000	84,000	.030750	.002750	....	....	
21,500	86,000	.033833	.003083	....	....	
22,000	88,000	.037000	.003167	....	....	
22,500	90,000	.040833	.003833	....	....	
23,000	92,000	.045000	.004167	....	....	
23,500	94,000	.0500	.0050	....	....	
24,000	96,000	.0583	.0083	....	....	
24,500	98,000	.0667	.0084	....	....	
25,000	100,000	.0800	.0133	....	....	
25,480	101,920	.1183	.0383	....	....	Tensile strength.

General summary.

Specific gravity		78,674
Hardness		21.05
Tensile strength per square inch of original section	pounds	101,920
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.1450
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2".65 from neck
Character of broken surface		silky
Elongation of inch sections		".07, ".10, ".12, ".34*, ".14, ".09

No. 2789.

Marks, $^{10}B^{1}A_{4}$ $T_{1}M$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000467	.000150	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	.000017	.000017	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001683	.000183	....	....	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001750	.000033	....	....	
13,250	53,000	.001817	.000067	....	....	
13,500	54,000	.001850	.000033	....	....	
13,750	55,000	.001867	.000017	....	....	
14,000	56,000	.001917	.000050	....	....	Elastic limit.
14,250	57,000	.002000	.000083	....	....	
14,500	58,000	.002167	.000167	....	....	
14,750	59,000	.002367	.000200	....	....	
15,000	60,000	.002833	.000466	....	....	
15,500	62,000	.007500	.004667	....	....	
16,000	64,000	.009000	.001500	....	....	
16,500	66,000	.010500	.001500	....	....	
17,000	68,000	.012000	.001500	....	....	
17,500	70,000	.013667	.001667	....	....	
18,000	72,000	.015333	.001666	....	....	
18,500	74,000	.017167	.001834	....	....	
19,000	76,000	.019000	.001833	....	....	
19,500	78,000	.021000	.002000	....	....	
20,000	80,000	.023000	.002000	....	....	
20,500	82,000	.025333	.002333	....	....	
21,000	84,000	.027667	.002334	....	....	
21,500	86,000	.0317	.004033	....	....	
22,000	88,000	.0333	.0016	....	....	
22,500	90,000	.0367	.0034	....	....	
23,000	92,000	.0417	.0050	....	....	
23,500	94,000	.0467	.0050	....	....	
24,000	96,000	.0517	.0050	....	....	
24,500	98,000	.0583	.0066	....	....	
25,000	100,000	.0633	.0050	....	....	
25,500	102,000	.0767	.0134	....	....	
25,990	103,960	.1133	.0366	....	....	Tensile strength.

General summary.

Specific gravity		7.8438
Hardness		22.14
Tensile strength per square inch of original section	pounds	103,960
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch	0.1517
Elongation per inch under strain at elastic limit	do	.001917
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		''.9 from neck
Character of broken surface		silky
Elongation of inch sections		''.33*, ''.12, ''.11, ''.14, ''.11, ''.10

No. 2787.

Marks, ${}^{10}{}^{R_1A_8}_{T_1M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000600	.000150	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
11,250	45,000	.001467	.000200	....	....	
12,500	50,000	.001683	.000116	....	....	
12,750	51,000	.001700	.000017	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001783	.000050	....	....	
13,500	54,000	.001833	.000050	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001900	.000033	....	....	
14,250	57,000	.001933	.000033	....	....	
14,500	58,000	.001983	.000050	....	....	
14,750	59,000	.002000	.000017	....	....	
15,000	60,000	.002033	.000033	....	....	
15,250	61,000	.002067	.000034	....	....	
15,500	62,000	.002133	.000066	....	....	Elastic limit.
15,750	63,000	.009100	.006967	....	....	
16,000	64,000	.009667	.000567	....	....	
16,500	66,000	.011333	.001666	....	....	
17,000	68,000	.013000	.001667	....	....	
17,500	70,000	.014500	.001500	....	....	
18,000	72,000	.016167	.001667	....	....	
18,500	74,000	.018000	.001833	....	....	
19,000	76,000	.020000	.002000	....	....	
19,500	78,000	.022000	.002000	....	....	
20,000	80,000	.024167	.002167	....	....	
20,500	82,000	.026500	.002333	....	....	
21,000	84,000	.0300	.0035	....	....	
21,500	86,000	.0333	.0033	....	....	
22,000	88,000	.0350	.0017	....	....	
22,500	90,000	.0400	.0050	....	....	
23,000	92,000	.0450	.0050	....	....	
23,500	94,000	.0483	.0033	....	....	
24,000	96,000	.0550	.0067	....	....	
24,500	98,000	.0633	.0083	....	....	
25,000	100,000	.0733	.0100	....	....	
25,500	102,000	.0917	.0184	....	....	
25,820	103,280	.1267	.0350	....	....	Tensile strength.

General summary.

Specific gravity		7.8462
Hardness		21.[illegible]
Tensile strength per square inch of original section	pounds	103,280
Elastic limit per square inch of original section	do	62,000
Elongation per inch after rupture	inch	0.1717
Elongation per inch under strain at elastic limit	do	0.002133
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		½″ from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.11, ″.15*, ″.37, ″.16, ″.12, ″.12

NEW HOOP.

No. 3005.

Marks, $^{10}\frac{R_1 A_6}{T_3 I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000517	.000184	0.	....	
5,000	20,000	.000683	.000166	0.	....	
6,250	25,000	.000850	.000167	0.	....	
7,500	30,000	.001033	.000183	.000033	.000033	
8,750	35,000	.001200	.000167	.000033	0.	
10,000	40,000	.001383	.000183	.000067	.000034	
11,250	45,000	.001550	.000167	....	....	
12,500	50,000	.001717	.000167	....	....	
12,750	51,000	.001783	.000066	....	....	
13,000	52,000	.001833	.000050	....	....	
13,250	53,000	.001867	.000034	....	....	
13,500	54,000	.001900	.000033	....	....	
13,750	55,000	.001950	.000050	....	....	
14,000	56,000	.001983	.000033	....	....	Elastic limit.
14,250	57,000	.002183	.000200	....	....	
14,500	58,000	.003117	.000934	....	....	
14,750	59,000	.004167	.001050	....	....	
15,000	60,000	.005833	.001666	....	....	
15,500	62,000	.007583	.001750	....	....	
16,000	64,000	.009167	.001584	....	....	
16,500	66,000	.010583	.001416	....	....	
17,000	68,000	.012167	.001584	....	....	
17,500	70,000	.013750	.001583	....	....	
18,000	72,000	.015450	.001700	....	....	
18,500	74,000	.017250	.001800	....	....	
19,000	76,000	.019000	.001750	....	....	
19,500	78,000	.021000	.002000	....	....	
20,000	80,000	.023000	.002000	....	....	
20,500	82,000	.025000	.002000	....	....	
21,000	84,000	.027417	.002417	....	....	
21,500	86,000	.030000	.002583	....	....	
22,000	88,000	.033083	.003083	....	....	
22,500	90,000	.036500	.002417	....	....	
23,000	92,000	.039167	.003667	....	....	
23,500	94,000	.0433	.004133	....	....	
24,000	96,000	.0500	.0067	....	....	
24,500	98,000	.0550	.0050	....	....	
25,000	100,000	.0633	.0083	....	....	
25,500	102,000	.0750	.0117	....	....	
25,900	103,600	.1000	.0250	....	....	Tensile streng

General summary.

Specific gravity 7.8407
Hardness 20.81
Tensile strength per square inch of original section ....pounds.. 103,600
Elastic limit per square inch of original section ....do.... 56,000
Elongation per inch after rupture ....inch.. 0.1017
Elongation per inch under strain at elastic limit ....do .... .001983
Reduction in diameter at point of rupture ....do.... .064
Reduction in area after rupture, per centum of original section 21.4
Position of rupture .... 1″.15 from neck
Character of broken surface ....granular; silky spot at circumference
Elongation of inch sections..................″.07, ″.08, ″.09, ″.08, ″.15, ″.14

THIRD HOOP.

No. 3075.

Marks, $^{10}\frac{B_1 A_4}{T_9 M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000650	.000183	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.001000	.000183	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001467	.000134	....	....	
12, 500	50, 000	.001667	.000200	....	....	
12, 750	51, 000	.001667	0.	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001733	.000033	....	....	
13, 500	54, 000	.001767	.000034	....	....	
13, 750	55, 000	.001817	.000050	....	....	
14, 000	56, 000	.001850	.000033	....	....	
14, 250	57, 000	.001883	.000033	....	....	Elastic limit.
14, 500	58, 000	.003833	.001950	....	....	
14, 750	59, 000	.004833	.001000	....	....	
15, 000	60, 000	.007500	.002667	....	....	
15, 500	62, 000	.009167	.001667	....	....	
16, 000	64, 000	.010667	.001500	....	....	
16, 500	66, 000	.012167	.001500	....	....	
17, 000	68, 0 0	.013667	.001500	....	....	
17, 500	70, 000	.015667	.002000	....	....	
18, 000	72, 000	.017500	.001833	....	....	
18, 500	74, 000	.019500	.002000	....	....	
19, 000	76, 000	.021833	.001833	....	....	
19, 500	78, 000	.023500	.002167	....	....	
20, 000	80, 000	.025833	.002333	....	....	
20, 500	82, 000	.028333	.002500	....	....	
21, 000	84, 000	.031000	.002667	....	....	
21, 500	86, 000	.0350	.0040	....	....	
22, 000	88, 000	.0383	.0033	....	....	
22, 500	90, 000	.0433	.0050	....	....	
23, 000	92, 000	.0483	.0050	....	....	
23, 500	94, 000	.0517	.0034	....	....	
24, 000	96, 000	.0600	.0083	....	....	
24, 500	98, 000	.0683	.0083	....	....	
25, 000	100, 000	.0833	.0150	....	....	
25, 280	101, 120	.1100	.0267	....	....	Tensile strength.

General summary.

Specific gravity		7.8431
Hardness		21.52
Tensile strength per square inch of original section	pounds..	101, 120
Elastic limit per square inch of original section	do....	57, 000
Elongation per inch after rupture	inch..	0.1283
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″ from neck
Character of broken surface		silky, interspersed with granular metal in spot near circumference
Elongation of inch sections		″.07, ″.08, ″.10, ″.10, ″.15, ″.27

FIFTH HOOP.

No. 3166.

Marks, $^{10\,R_1\,A_8}_{T_{15}\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000650	.000183	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.000983	.000166	0.	....	
8, 750	35, 000	.001150	.000167	0.	....	
10, 000	40, 000	.001333	.000183	0.	....	
11, 250	45, 000	.001483	.000150	....	....	
12, 500	50, 000	.001667	.000184	....	....	
12, 750	51, 000	.001683	.000016	....	....	
13, 000	52, 000	.001733	.000050	....	....	
13, 250	53, 000	.001767	.000034	....	....	
13, 500	54, 000	.001817	.000050	....	....	
13, 750	55, 000	.001850	.000033	....	....	
14, 000	56, 000	.001883	.000033	....	....	
14, 250	57, 000	.001933	.000050	....	....	
14, 500	58, 000	.001967	.000034	....	....	
14, 750	59, 000	.002000	.000033	....	....	Elastic limit.
15, 000	60, 000	.002067	.000067	....	....	
15, 250	61, 000	.002183	.000116	....	....	
15, 500	62, 000	.002567	.000384	....	....	
15, 750	63, 000	.002933	.000366	....	....	
16, 000	64, 000	.003750	.000817	....	....	
16, 500	66, 000	.005583	.001833	....	....	
17, 000	68, 000	.007000	.001417	....	....	
17, 500	70, 000	.008333	.001333	....	....	
18, 000	72, 000	.009500	.001167	....	....	
18, 500	74, 000	.010683	.001183	....	....	
19, 000	76, 000	.012000	.001317	....	....	
19, 500	78, 000	.013250	.001250	....	....	
20, 000	80, 000	.014783	.001533	....	....	
20, 500	82, 000	.016167	.001384	....	....	
21, 000	84, 000	.017633	.001466	....	....	
21, 500	86, 000	.019083	.001450	....	....	
22, 000	88, 000	.020583	.001500	....	....	
22, 500	90, 000	.022267	.001684	....	....	
23, 000	92, 000	.024167	.001900	....	....	
23, 500	94, 000	.026000	.001833	....	....	
24, 000	96, 000	.027917	.001917	....	....	
24, 500	98, 000	.029833	.001916	....	....	
25, 000	100, 000	.0333	.003437	....	....	
25, 500	102, 000	.0367	.0034	....	....	
26, 000	104, 000	.0400	.0033	....	....	
26, 500	106, 000	.0433	.0033	....	....	
27, 000	108, 000	.0467	.0034	....	....	
27, 500	110, 000	.0500	.0033	....	....	
28, 000	112, 000	.0583	.0083	....	....	
28, 500	114, 000	.0683	.0100	....	....	
28, 700	114, 800	.0683	0.	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	114, 800
Elastic limit per square inch of original section	do....	59, 000
Elongation per inch after rupture	inch..	.0683
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.024
Reduction in area after rupture, per centum of original section		8.4
Position of rupture		2".25 from neck
Character of broken surface		granular
Elongation of inch sections		".06, ".04, ".05*, ".10, ".07, ".09

No. 2829.

Marks, $^{10}\frac{R_1 A_7}{T_1 M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000133	.000133			Initial load.
2,500	10,000	.000300	.000167			
3,750	15,000	.000467	.000167			
5,000	20,000	.000650	.000183	.000017	.000017	
6,250	25,000	.000800	.000150			
7,500	30,000	.000983	.000183			
8,750	35,000	.001150	.000167			
10,000	40,000	.001317	.000167	.000033	.000016	
11,250	45,000	.001467	.000150			
12,500	50,000	.001633	.000166			
12,750	51,000	.001667	.000034			
13,000	52,000	.001717	.000050			
13,250	53,000	.001750	.000033			
13,500	54,000	.001783	.000033			
13,750	55,000	.001817	.000034			
14,000	56,000	.001867	.000050			
14,250	57,000	.001900	.000033			
14,500	58,000	.001950	.000050			
14,750	59,000	.002000	.000050			Elastic limit.
15,000	60,000	.002083	.000083			
15,250	61,000	.002267	.000184			
15,500	62,000	.002633	.000366			
15,750	63,000	.002967	.000334			
16,000	64,000	.003750	.000783			
16,500	66,000	.004883	.001133			
17,000	68,000	.006217	.001334			
17,500	70,000	.007717	.001500			
18,000	72,000	.009217	.001500			
18,500	74,000	.010500	.001283			
19,000	76,000	.012000	.001500			
19,500	78,000	.013500	.001500			
20,000	80,000	.015167	.001667			
20,500	82,000	.017000	.001833			
21,000	84,000	.018667	.001667			
21,500	86,000	.020500	.001833			
22,000	88,000	.022500	.002000			
22,500	90,000	.024500	.002000			
23,000	92,000	.026667	.002167			
23,500	94,000	.029000	.002333			
24,000	96,000	.031667	.002667			
24,500	98,000	.0350	.003333			
25,000	100,000	.0400	.0050			
25,500	102,000	.0433	.0033			
26,000	104,000	.0467	.0034			
26,500	106,000	.0517	.0050			
27,000	108,000	.0600	.0083			
27,500	110,000	.0700	.0100			
27,840	111,360	.0917	.0217			Tensile strength.

General summary.

Specific gravity 7.841
Hardness 21.7
Tensile strength per square inch of original section .... pounds .. 111,36
Elastic limit per square inch of original section .... do ... 59,00
Elongation per inch after rupture .... inch .. 0.113
Elongation per inch under strain at elastic limit .... do .... .002000
Reduction in diameter at point of rupture .... do .... .104
Reduction in area after rupture, per centum of original section 33.5
Position of rupture .... 1" from neck
Character of broken surface .... granular, at circumference, 60 per cent.; silky center, 40 per cent.
Elongation of inch sections .... ".27*, ".14, ".08, ".07, ".06, ".06

No. 2850.

Marks, $^{10\ \mathrm{B},\ \mathrm{A},}_{\mathrm{T}_3\ \mathrm{M}}$
Diameter, ".564.
Sectional area, ".25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000617	.000184	0.	....	
6,250	25,000	.000767	.000150	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001117	.000184	0.	....	
10,000	40,000	.001283	.000166	0.	....	
11,250	45,000	.001450	.000167	....	....	
12,500	50,000	.001617	.000167	....	....	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001700	.000050	....	....	
13,250	53,000	.001717	.000017	....	....	
13,500	54,000	.001750	.000033	....	....	
13,750	55,000	.001800	.000050	....	....	
14,000	56,000	.001850	.000050	....	....	
14,250	57,000	.001900	.000050	....	....	Elastic limit.
14,500	58,000	.002367	.000467	....	....	
14,750	59,000	.002883	.000516	....	....	
15,000	60,000	.004333	.001450	....	....	
15,500	62,000	.005900	.001567	....	....	
16,000	64,000	.007333	.001433	....	....	
16,500	66,000	.008833	.001500	....	....	
17,000	68,000	.010283	.001450	....	....	
17,500	70,000	.011833	.001550	....	....	
18,000	72,000	.013333	.001500	....	....	
18,500	74,000	.015000	.001667	....	....	
19,000	76,000	.016667	.001667	....	....	
19,500	78,000	.018333	.001666	....	....	
20,000	80,000	.020167	.001834	....	....	
20,500	82,000	.022200	.002033	....	....	
21,000	84,000	.024283	.002083	....	....	
21,500	86,000	.026667	.002384	....	....	
22,000	88,000	.029000	.002333	....	....	
22,500	90,000	.031667	.002667	....	....	
23,000	92,000	.0350	.003333	....	....	
23,500	94,000	.0383	.0033	....	....	
24,000	96,000	.0417	.0034	....	....	
24,500	98,000	.0467	.0050	....	....	
25,000	100,000	.0500	.0033	....	....	
25,500	102,000	.0567	.0067	....	....	
26,000	104,000	.0683	.0116	....	....	
26,500	106,000	.0850	.0167	....	....	
26,700	106,800	.1050	.0200	....	....	Tensile strength.

General summary.

Specific gravity		7.8426
Hardness		21.76
Tensile strength per square inch of original section	pounds	106,800
Elastic limit per square inch of original section	do	57,000
Elongation per inch after rupture	inch	0.1300
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1".15 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		".08, ".08, ".09, ".10, "18, ".25*

B HOOPS.

No. 2790.

Marks, $\begin{smallmatrix}{}^{10}R_1B_3\\T_2M\end{smallmatrix}$
Diameter, ".564.
Sectional area, .25 square inch.

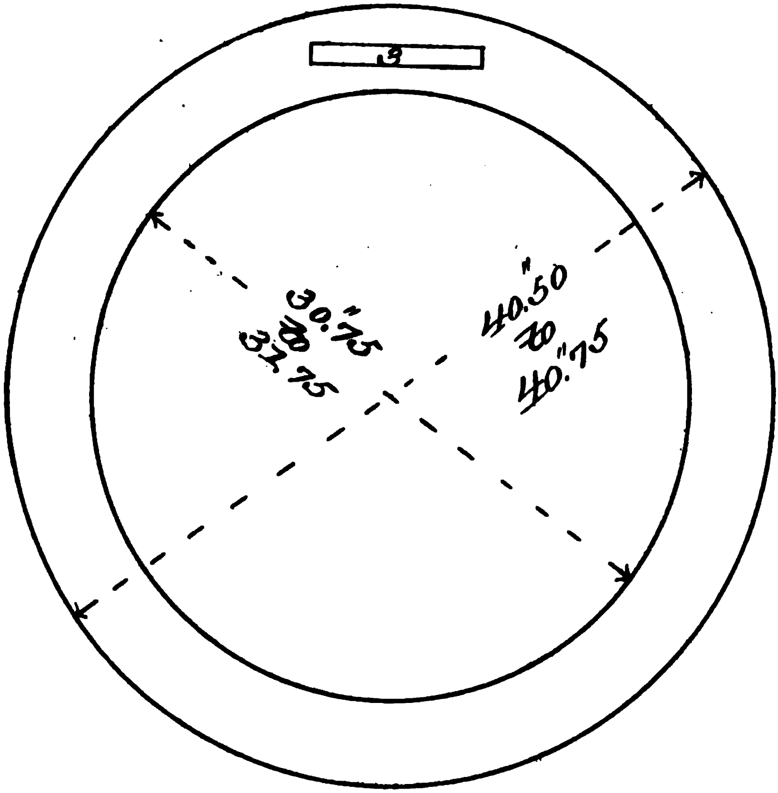
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000650	.000150	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	0.	....	
11,250	45,000	.001517	.000167	....	....	
12,500	50,000	.001700	.000183	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001817	.000034	....	....	
13,500	54,000	.001850	.000033	....	....	
13,750	55,000	.001883	.000033	....	....	
14,000	56,000	.001933	.000050	....	....	
14,250	57,000	.001967	.000034	....	....	Elastic limit.
14,500	58,000	.002083	.000116	....	....	
14,750	59,000	.003833	.000750	....	....	
15,000	60,000	.005167	.001334	....	....	
15,500	62,000	.006667	.001500	....	....	
16,000	64,000	.008167	.001500	....	....	
16,500	66,000	.009667	.001500	....	....	
17,000	68,000	.011333	.001666	....	....	
17,500	70,000	.012833	.001500	....	....	
18,000	72,000	.014333	.001500	....	....	
18,500	74,000	.016333	.002000	....	....	
19,000	76,000	.018000	.001667	....	....	
19,500	78,000	.019833	.001833	....	....	
20,000	80,000	.022000	.002167	....	....	
20,500	82,000	.023833	.001833	....	....	
21,000	84,000	.026000	.002167	....	....	
21,500	86,000	.028500	.002500	....	....	
22,000	88,000	.0317	.0032	....	....	
22,500	90,000	.0350	.0033	....	....	
23,000	92,000	.0383	.0033	....	....	
23,500	94,000	.0417	.0034	....	....	
24,000	96,000	.0467	.0050	....	....	
24,500	98,000	.0517	.0050	....	....	
25,000	100,000	.0583	.0066	....	....	
25,000	102,000	.0700	.0117	....	....	
26,000	104,000	.0900	.0200	....	....	
26,210	104,840	.1100	.0200	....	....	Tensile strength.

General summary.

Specific gravity		7.8400
Hardness		22.90
Tensile strength per square inch of original section	pounds..	104,840
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1350
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1¾" from neck
Character of broken surface		silky
Elongation of inch sections		".09, ".10, ".11, ".13, ".28*, ".10

10 inch steel B. L. Rifle

B Hoops



No. 2785.

Marks, $^{10\,R_1\,B_6}_{T_6\,M}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000350	.000183	0.	....	
3,750	15,000	.000517	.000167	0.	....	
5,000	20,000	.000700	.000183	0.	....	
6,250	25,000	.000850	.000150	0.	....	
7,500	30,000	.001000	.000150	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	Elastic limit.
14,250	57,000	.006000	.004133	....	....	
14,500	58,000	.007500	.001500	....	....	
14,750	59,000	.008333	.000833	....	....	
15,000	60,000	.009167	.000834	....	....	
15,500	62,000	.010500	.001333	....	....	
16,000	64,000	.012167	.001667	....	....	
16,500	66,000	.013833	.001666	....	....	
17,000	68,000	.015667	.001834	....	....	
17,500	70,000	.017500	.001833	....	....	
18,000	72,000	.019333	.001833	....	....	
18,500	74,000	.021500	.002167	....	....	
19,000	76,000	.023833	.002333	....	....	
19,500	78,000	.0267	.002867	....	....	
20,000	80,000	.0283	.0016	....	....	
20,500	82,000	.0317	.0034	....	....	
21,000	84,000	.0367	.0050	....	....	
21,500	86,000	.0400	.0033	....	....	
22,000	88,000	.0417	.0017	....	....	
22,500	90,000	.0467	.0050	....	....	
23,000	92,000	.0533	.0066	....	....	
23,500	94,000	.0600	.0067	....	....	
24,000	96,000	.0717	.0117	....	....	
24,500	98,000	.0900	.0183	....	....	
24,730	98,920	.1183	.0283	....	....	Tensile strength.

General summary.

Specific gravity		7.8424
Hardness		21.64
Tensile strength per square inch of original section	pounds	98,920
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch	0.1700
Elongation per inch under strain at elastic limit	do	.001867
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		''.75 from middle of stem
Character of broken surface		silky
Elongation of inch sections		''.09, ''.14, ''.39*, ''.17, ''.14, ''.00

NEW HOOP.

No. 2878.

Marks, $^{10\,R_1\,B_6}_{T_9\,M}$
Diameter, ".565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001517	.000184	....	....	
12,500	50,000	.001683	.000166	....	....	
12,750	51,000	.001733	.000050	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001817	.000034	....	....	
13,500	54,000	.001867	.000050	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001967	.000067	....	....	
14,250	57,000	.002017	.000050	....	....	Elastic limit.
14,500	58,000	.002117	.000100	....	....	
14,750	59,000	.002200	.000083	....	....	
15,000	60,000	.002417	.000217	....	....	
15,250	61,000	.002667	.000250	....	....	
15,500	62,000	.003183	.000516	....	....	
16,000	64,000	.004250	.001067	....	....	
16,500	66,000	.005600	.001350	....	....	
17,000	68,000	.007250	.001650	....	....	
17,500	70,000	.008667	.001417	....	....	
18,000	72,000	.010167	.001500	....	....	
18,500	74,000	.011667	.001500	....	....	
19,000	76,000	.013000	.001333	....	....	
19,500	78,000	.014600	.001600	....	....	
20,000	80,000	.016500	.001900	....	....	
20,500	82,000	.018167	.001667	....	....	
21,000	84,000	.019833	.001666	....	....	
21,500	86,000	.021683	.001850	....	....	
22,000	88,000	.023750	.002067	....	....	
22,500	90,000	.026000	.002250	....	....	
23,000	92,000	.028333	.002333	....	....	
23,500	94,000	.030667	.002334	....	....	
24,000	96,000	.0333	.002633	....	....	
24,500	98,000	.0367	.0034	....	....	
25,000	100,000	.0417	.0050	....	....	
25,500	102,000	.0467	.0050	....	....	
26,000	104,000	.0517	.0050	....	....	
26,500	106,000	.0567	.0050	....	....	
27,000	108,000	.0667	.0100	....	....	
27,500	110,000	.0867	.0200	....	....	
27,640	110,560	.1067	.0200	....	....	Tensile strength.

General summary.

Specific gravity	7.8436
Hardness	24.12
Tensile strength per square inch of original section ...pounds..	110,560
Elastic limit per square inch of original section ...do....	57,000
Elongation per inch after rupture ...inch..	0.1350
Elongation per inch under strain at elastic limit ...do....	.002017
Reduction in diameter at point of rupture ...do....	.105
Reduction in area after rupture, per centum of original section	33.5
Position of rupture	2".50 from neck
Character of broken surface	granular, 60 per cent.; silky center, 40 per cent.
Elongation of inch sections	".09, ".15, ".27*, ".11, ".10, ".09

No. 3074.

Marks, $\genfrac{}{}{0pt}{}{10\ R_1\ B\ 6}{T_{13}\ M}$
Diameter, ″.564.
Sectional area, ″.25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000267	.000150	0.	....	
3, 750	15, 000	.000417	.000150	— .000017	— .000017	
5, 000	20, 000	.000567	.000150	— .000017	0.	
6, 250	25, 000	.000717	.000150	— .000017	0.	
7, 500	30, 000	.000883	.000166	— .000017	0.	
8, 750	35, 000	.00 050	.000167	— .000017	0.	
10, 000	40, 000	.001217	.000167	— .000017	0.	
11, 250	45, 000	.001417	.000200	....	....	
12, 500	50, 000	.001600	.000183	....	....	
12, 750	51, 000	.001633	.000033	....	....	
13, 000	52, 000	.001667	.000034	....	....	
13, 250	53, 000	.001683	.000016	....	....	
13, 500	54, 000	.001733	.000050	....	....	Elastic limit.
13, 750	55, 000	.001800	.000067	....	....	
14, 000	56, 000	.001883	.000083	....	....	
14, 250	57, 000	.003167	.001284	....	....	
14, 500	58, 000	.004167	.001000	....	....	
14, 750	59, 000	.005167	.001000	....	....	
15, 000	60, 000	.006000	.000833	....	....	
15, 500	62, 000	.007333	.001333	....	....	
16, 000	64, 000	.008833	.001500	....	....	
16, 500	66, 000	.010333	.001500	....	....	
17, 000	68, 000	.011833	.001500	....	....	
17, 500	70, 000	.013500	.001667	....	....	
18, 000	72, 000	.015167	.001667	....	....	
18, 500	74, 000	.016833	.001666	....	....	
19, 000	76, 000	.018667	.001834	....	....	
19, 500	78, 000	.020500	.001833	....	....	
20, 000	80, 000	.022667	.002167	....	....	
20, 500	82, 000	.024833	.002166	....	....	
21, 000	84, 000	.027167	.002334	....	....	
21, 500	86, 000	.029667	.002500	....	....	
22, 000	88, 000	.032333	.002666	....	....	
22, 500	90, 000	.035833	.003500	....	....	
23, 000	92, 000	.0400	.004167	....	....	
23, 500	94, 000	.0442	.0042	....	....	
24, 000	96, 000	.0483	.0041	....	....	
24, 500	98. 000	.0533	.0050	....	....	
25, 000	100, 000	.0633	.0100	....	....	
25, 500	102, 000	.0750	.0117	....	....	
26, 000	104, 000	.0983	.0233	....	....	
26, 080	104, 320	.1133	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104, 320
Elastic limit per square inch of original section	do ..	51, 000
Elongation per inch after rupture	inch..	0. 1350
Elongation per inch under strain at elastic limit	do....	.001733
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		2″.80 from neck
Character of broken surface		silky, interspersed with granular metal at the circumference
Elongation of inch sections		″.07, ″.09, ″.13, ″.31*, ″.12. ″.09

No. 2822.

Marks, $\overset{10\,R_1\,B_7}{T_2\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	**Initial load.**
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000283	.000183	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000633	.000183	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001117	.000150	0.	....	
10,000	40,000	.001283	.000166	0.	....	
11,250	45,000	.001433	.000150	....	....	
11,500	46,000	.001467	.000034	....	....	
11,750	47,000	.001517	.000050	....	....	
12,000	48,000	.001550	.000033	....	....	
12,250	49,000	.001600	.000050	....	....	
12,500	50,000	.001633	.000033	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001683	.000016	....	....	
13,250	53,000	.001717	.000034	....	....	
13,500	54,000	.001767	.000050	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001833	.000033	....	....	
14,250	57,000	.001867	.000034	....	....	
14,500	58,000	.001917	.000050	....	....	
14,750	59,000	.001950	.000033	....	....	
15,000	60,000	.001983	.000033	....	....	
15,250	61,000	.002017	.000034	....	....	
15,500	62,000	.002050	.000033	....	....	**Elastic limit.**
15,750	63,000	.002150	.000100	....	....	
16,000	64,000	.006667	.004517	....	....	
16,500	66,000	.008850	.002183	....	....	
17,000	68,000	.010000	.001150	....	....	
17,500	70,000	.011500	.001500	....	....	
18,000	72,000	.013000	.001500	....	....	
18,500	74,000	.014500	.001500	....	....	
19,000	76,000	.015917	.001417	....	....	
19,500	78,000	.017383	.001466	....	....	
20,000	80,000	.019167	.001784	....	....	
20,500	82,000	.020867	.001700	....	....	
21,000	84,000	.022667	.001800	....	....	
21,500	86,000	.024750	.002083	....	....	
22,000	88,000	.026867	.002117	....	....	
22,500	90,000	.0300	.003133	....	....	
23,000	92,000	.0333	.0033	....	....	
23,500	94,000	.0367	.0034	....	....	
24,000	96,000	.0383	.0016	....	....	
24,500	98,000	.0433	.0050	....	....	
25,000	100,000	.0467	.0034	....	....	
25,500	102,000	.0517	.0050	....	....	
26,000	104,000	.0600	.0083	....	....	
26,500	106,000	.0667	.0067	....	....	
27,000	108,000	.0800	.0133	....	....	
27,390	109,560	.1133	.0333	....	....	**Tensile strength.**

General summary.

Specific gravity	7.8419
Hardness	21.64
Tensile strength per square inch of original section .... pounds	109,560
Elastic limit per square inch of original section .... do	62,000
Elongation per inch after rupture .... inch	0.1533
Elongation per inch under strain at elastic limit .... do	.002050
Reduction in diameter at point of rupture .... do	.144
Reduction in area after rupture, per centum of original section	44.6
Position of rupture	2⅛" from neck
Character of broken surface	fine silky
Elongation of inch sections	".13, ".23, ".27*, ".11, ".09, ".09

NEW HOOP C.

Exterior diameter, 24″.5.
Interior diameter, 16″.

No. 3001.

Marks, $\overset{10\,B,\,C_3}{T,\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000667	.000184	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	.000083	.000083	
11,250	45,000	.001517	.000167	....	....	
12,500	50,000	.001683	.000166	....	....	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001817	.000050	....	....	
13,500	54,000	.001867	.000050	....	....	Elastic limit.
13,750	55,000	.001933	.000066	....	....	
14,000	56,000	.003300	.001367	....	....	
14,250	57,000	.004583	.001283	....	....	
14,500	58,000	.005833	.001250	....	....	
14,750	59,000	.006667	.000834	....	....	
15,000	60,000	.007500	.000833	....	....	
15,500	62,000	.009017	.001517	....	....	
16,000	64,000	.010750	.001733	....	....	
16,500	66,000	.012333	.001583	....	....	
17,000	68,000	.014000	.001667	....	....	
17,500	70,000	.015833	.001833	....	....	
18,000	72,000	.017667	.001834	....	....	
18,500	74,000	.019833	.002166	....	....	
19,000	76,000	.021667	.001834	....	....	
19,500	78,000	.024333	.002666	....	....	
20,000	80,000	.026667	.002334	....	....	
20,500	82,000	.029333	.002666	....	....	
21,000	84,000	.031667	.002334	....	....	
21,500	86,000	.034417	.002750	....	....	
22,000	88,000	.037833	.002916	....	....	
22,500	90,000	.0433	.005967	....	....	
23,000	92,000	.0483	.0050	....	....	
23,500	94,000	.0533	.0050	....	....	
24,000	96,000	.0617	.0084	....	....	
24,500	98,000	.0700	.0083	....	....	
25,000	100,000	.0867	.0167	....	....	
25,290	101,160	.1067	.0200	....	....	Tensile strength.

General summary.

Specific gravity		7.8381
Hardness		21.17
Tensile strength per square inch of original section	pounds	101,160
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.1583
Elongation per inch under strain at elastic limit	do	.001867
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		3″ from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.09, ″.11, ″.13, ″.34*, ″.13, ″.12

THIRD HOOP C₃.

Exterior diameter, 24″.
Interior diameter, 16″.

No. 3107.

Marks, $^{10\,B_1C_3}_{\;T_{12}M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent se .	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000483	.000183	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000800	.000150	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001650	.000183	....	....	
12,750	51,000	.001667	.0000 7	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001750	.000050	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001917	.000050	....	....	Elastic limit.
14,500	58,000	.009967	.008050	....	....	
14,750	59,000	.010333	.000366	....	....	
15,000	60,000	.011167	.000834	....	....	
15,500	62,000	.012833	.001666	....	....	
16,000	64,000	.014600	.001767	....	....	
16,500	66,000	.016583	.001983	....	....	
17,000	68,000	.018667	.002084	....	....	
17,500	70,000	.020500	.001833	....	....	
18,000	72,000	.022800	.002300	....	....	
18,500	74,000	.025417	.002617	....	....	
19,000	76,000	.027667	.002250	....	....	
19,500	78,000	.030583	.002916	....	....	
20,000	80,000	.0350	.004417	....	....	
20,500	82,000	.0375	.0025	....	....	
21,000	84,000	.0400	.0025	....	....	
21,500	86,000	.0467	.0067	....	....	
22,000	88,000	.0500	.0033	....	....	
22,500	90,000	.0583	.0083	....	....	
23,000	92,000	.0667	.0084	....	....	
23,500	94,000	.0833	.0166	....	....	
24,000	96,000	.1017	.0184	....	....	
24,100	96,400	.1267	.0250	....	....	Tensile strength.

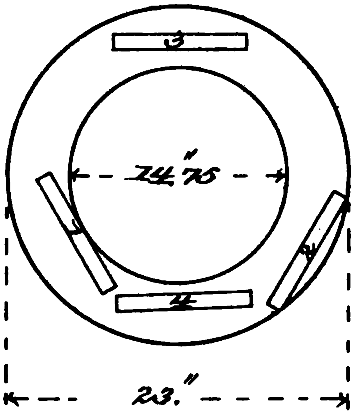
General summary.

Specific gravity.. 7.8467
Hardness.. 18.57
Tensile strength per square inch of original section........................pounds.. 96,400
Elastic limit per square inch of original section........................do ... 57,000
Elongation per inch after rupture........................inch.. 0.1182
Elongation per inch under strain at elastic limit........................do ... .001917
Reduction in diameter at point of rupture........................do ... .094
Reduction in area after rupture, per centum of original section........................ 30.6
Position of rupture........................1″ from neck
Character of broken surface.........silky; opened cracks in stem in the vicinity of point of rupture
Elongation of inch sections........................″.21*, ″.20, ″.11, ″.12, ″.12, ″.1

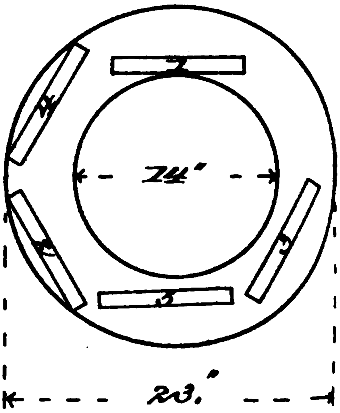
10 inch Steel B. L. Rifle

Hoop C4

Breech



Muzzle



HOOP C_4.

No. 2962.

Marks, $^{10\ B;\ C_4}_{\ \ B\ T;\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000150	.000150	0.		
2, 500	10, 000	.000317	.000167	0.		
3, 750	15. 000	.000483	.000166	0.		
5, 000	20, 000	.000650	.0 0167	0.		
6. 250	25, 000	.000817	.000167	0.		
7, 500	30, 000	.000983	.000166	0.		
8, 750	35, 000	.001150	.000167	0.		
10, 000	40, 000	.001333	.000183	.000017	.000017	
11, 250	45, 000	.001500	.000167			
12, 500	50, 000	.001667	.000167			
12, 750	51, 000	.001700	.000033			
13, 000	52, 000	.001733	.000033			
13, 250	53, 000	.001783	.000050			
13, 500	54, 000	.001833	.000050			Elastic limit.
13, 750	55, 000	.002433	.000600			
14, 000	56, 000	.004333	.001900			
14, 250	57, 000	.005167	.000834			
14, 500	58, 000	.005833	.000666			
14, 750	59, 000	.006367	.000534			
15, 000	60, 000	.007250	.000883			
15, 500	62, 000	.00-917	.001667			
16, 000	64, 000	.010600	.001683			
16. 500	66, 000	.012250	.001650			
17, 000	68, 000	.014000	.001750			
17, 500	70, 000	.015667	.001667			
18, 000	72, 000	.017683	.002016			
18, 500	74, 000	.019667	.001984			
19, 000	76, 000	.021667	.002000			
19, 500	78, 000	.024167	.002500			
20, 000	80, 000	.026417	.002250			
20, 500	82, 000	.028833	.002416			
21, 000	84, 000	.0317	.002867			
21, 500	86, 000	.0350	.0033			
22, 000	88, 000	.0383	.0033			
22, 500	90, 000	.0433	.0050			
23, 000	92, 000	.0483	.0050			
23, 500	94, 000	.0550	.0067			
24, 000	96, 000	.0633	.0083			
24, 500	98, 000	.0750	.0117			
25, 000	100, 000	.1100	.0350			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100, 000
Elastic limit per square inch of original section	do....	54, 000
Elongation per inch after rupture	inch..	0. 1767
Elongation per inch under strain at elastic limit	do	.001833
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		2".90 from neck
Character of broken surface		fine silky
Elongation of inch sections		".10, ".13, ".16, ".37*, ".18, ".12

No. 2963.

Marks, $\frac{10\ R_1\ C_4}{B\ T_2\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001350	.000183	0.	....	
11, 250	45, 000	.001500	.000150	....	....	
12, 500	50, 000	.001667	.000167	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001750	.000050	....	....	
13, 250	53, 000	.001783	.000033	....	....	
13, 500	54, 000	.001833	.000050	....	....	
13, 750	55, 000	.001867	.000034	....	....	
14, 000	56, 000	.001900	.000033	....	....	
14, 250	57, 000	.001933	.000033	....	....	
14, 500	58, 000	.001983	.000050	....	....	
14, 750	59, 000	.002017	.000034	....	....	Elastic limit.
15, 000	60, 000	.002150	.000133	....	....	
15, 250	61, 000	.003167	.001017	....	....	
15, 500	62, 000	.004250	.001083	....	....	
16, 000	64, 000	.005917	.001667	....	....	
16, 500	66, 000	.007083	.001166	....	....	
17, 000	68, 000	.008500	.001417	....	....	
17, 500	70, 000	.009967	.001467	....	....	
18, 000	72, 000	.011333	.001366	....	....	
18, 500	74, 000	.013000	.001667	....	....	
19, 000	76, 000	.014250	.001250	....	....	
19, 500	78, 000	.015833	.001583	....	....	
20, 000	80, 000	.017667	.001834	....	....	
20, 500	82, 000	.019250	.001583	....	....	
21, 000	84, 000	.021000	.001750	....	....	
21, 500	86, 000	.022917	.001917	....	....	
22, 000	88, 000	.025000	.002083	....	....	
32, 500	90, 000	.027167	.002167	....	....	
23, 000	92, 000	.0300	.002833	....	....	
23, 500	94, 000	.0333	.0033	....	....	
24, 000	96, 000	.0367	.0034	....	....	
24, 500	98, 000	.0400	.0033	....	....	
25, 000	100, 000	.0450	.0050	....	....	
25, 500	102, 000	.0483	.0033	....	....	
26, 000	104, 000	.0517	.0034	....	....	
26, 500	106, 000	.0600	.0083	....	....	
27, 000	108, 000	.0717	.0117	....	....	
27, 500	110, 000	.0917	.0200	....	....	
27, 530	110, 120	.1033	.0116	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	110, 120
Elastic limit per square inch of original section	do	59, 000
Elongation per inch after rupture	inch	0. 1283
Elongation per inch under strain at elastic limit	do	.002017
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		at middle
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.09, ″.12, ″.18, ″.21* ″.10, ″.07

No. 2964.

Marks, $\substack{10\,R_1\,C_4 \\ B\,T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000483	.000183	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001333	.000183	0.	....	
11,250	45,000	.001483	.000150	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001783	.000050	....	....	
13,500	54,000	.001833	.000050	....	....	Elastic limit.
13,750	55,000	.002083	.000250	....	....	
14,000	56,000	.004033	.001950	....	....	
14,250	57,000	.004750	.000717	....	....	
14,500	58,000	.005600	.000850	....	....	
14,750	59,000	.006033	.000433	....	....	
15,000	60,000	.006367	.000834	....	....	
15,500	62,000	.008533	.001666	....	....	
16,000	64,000	.009833	.001300	....	....	
16,500	66,000	.011583	.001750	....	....	
17,000	68,000	.013000	.001417	....	....	
17,500	70,000	.014500	.001500	....	....	
18,000	72,000	.016250	.001750	....	....	
18,500	74,000	.018167	.001917	....	....	
19,000	76,000	.019917	.001750	....	....	
19,500	78,000	.022000	.002083	....	....	
20,000	80,000	.024100	.002100	....	....	
20,500	82,000	.026333	.002233	....	....	
21,000	84,000	.0300	.003667	....	....	
21,500	86,000	.0333	.0033	....	....	
22,000	88,000	.0350	.0017	....	....	
22,500	90,000	.0367	.0017	....	....	
23,000	92,000	.0400	.0033	....	....	
23,500	94,000	.0450	.0050	....	....	
24,000	96,000	.0517	.0067	....	....	
24,500	98,000	.0617	.0100	....	....	
25,000	100,000	.0717	.0100	....	....	
25,300	101,200	.0950	.0233	....	....	Tensile strength.

General summary.

Specific gravity		7,8617
Hardness		22.64
Tensile strength per square inch of original section	pounds	101,200
Elastic limit per square inch of original section	do	54,000
Elongation per inch after rupture	inch	0.1383
Elongation per inch under strain at elastic limit	do	.001833
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		at middle
Character of broken surface		silky
Elongation of inch sections		″.06, ″.10, ″.18, ″.28*, ″.12, ″.09

No. 2971.

Marks, $^{10\,\mathrm{B_1\,C_4}}_{\mathrm{B\,T_4\,M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000317	.000184	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000650	.000167	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.001000	.000183	.000017	.000017	
8, 750	35, 000	.001183	.000183	.000017	0.	
10, 000	40, 000	.001350	.000167	.000017	0.	
11, 250	45, 000	.001533	.000183	....	....	
12, 500	50, 000	.001717	.000184	....	....	
12, 750	51, 000	.001750	.000033	....	....	
13, 000	52, 000	.001783	.000033	....	....	
13, 250	53, 000	.001833	.000050	....	....	
13, 500	54, 000	.001867	.000034	....	....	
13, 750	55, 000	.001917	.000050	....	....	Elastic limit.
14, 000	56, 000	.002000	.000083	....	....	
14, 250	57, 000	.003100	.001100	....	....	
14, 500	58, 000	.003833	.000733	....	....	
14, 750	59, 000	.004467	.000634	....	....	
15, 000	60, 000	.005250	.000783	....	....	
15, 500	62, 000	.006583	.001333	....	....	
16, 000	64, 000	.007917	.001334	....	....	
16, 500	66, 000	.009333	.001416	....	....	
17, 000	68, 000	.010667	.001334	....	....	
17, 500	70, 000	.012250	.001583	....	....	
18, 000	72, 000	.013667	.001417	....	....	
18, 500	74, 000	.015217	.001550	....	....	
19, 000	76, 000	.017000	.001783	....	....	
19, 500	78, 000	.018750	.001750	....	....	
20, 000	80, 000	.020367	.001617	....	....	
20, 500	82, 000	.022333	.001966	....	....	
21, 000	84, 000	.024417	.002084	....	....	
21, 500	86, 000	.026583	.002166	....	....	
22, 000	88, 000	.028833	.002250	....	....	
22, 500	90, 000	.0333	.004467	....	....	
23, 000	92, 000	.0367	.0034	....	....	
23, 500	94, 000	.0383	.0016	....	....	
24, 000	96, 000	.0417	.0034	....	....	
24, 500	98, 000	.0467	.0050	....	....	
25, 000	100, 000	.0533	.0066	....	....	
25, 500	102, 000	.0617	.0084	....	....	
26, 000	104, 000	.0700	.0083	....	....	
26, 340	105, 360	.0917	.0217	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	105,360
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1117
Elongation per inch under strain at elastic limit	do	.001917
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		[illegible].5
Position of rupture		3".1 from neck
Character of broken surface		granular; silky eccentric spot
Elongation of inch sections		".05, ".11, ".26, ".13, ".07, ".05

No. 2965.

Marks, $\genfrac{}{}{0pt}{}{10\ R_1\ C_4}{M\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001950	.000050	....	....	
14,750	59,000	.002000	.000050	....	....	
15,000	60,000	.002050	.000050	....	....	Elastic limit.
15,250	61,000	.002200	.000150	....	....	
15,500	62,000	.002567	.000367	....	....	
16,000	64,000	.004667	.002100	....	....	
16,500	66,000	.006000	.001333	....	....	
17,000	68,000	.006967	.000967	....	....	
17,500	70,000	.008333	.001366	....	....	
18,000	72,000	.010000	.001667	....	....	
18,500	74,000	.011517	.001517	....	....	
19,000	76,000	.013167	.001650	....	....	
19,500	78,000	.014583	.001416	....	....	
20,000	80,000	.016267	.001684	....	....	
20,500	82,000	.018000	.001733	....	....	
21,000	84,000	.019400	.001400	....	....	
21,500	86,000	.021250	.001850	....	....	
22,000	88,000	.023333	.002083	....	....	
22,500	90,000	.025500	.002167	....	....	
23,000	92,000	.027417	.001917	....	....	
23,500	94,000	.0300	.002583	....	....	
24,000	96,000	.0333	.0033	....	....	
24,500	98,000	.0367	.0034	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0450	.0050	....	....	
26,000	104,000	.0500	.0050	....	....	
26,500	106,000	.0550	.0050	....	....	
27,000	108,000	.0617	.0067	....	....	
27,500	110,000	.0750	.0133	....	....	
27,800	111,200	.0960	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,200
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.1050
Elongation per inch under strain at elastic limit	do....	.002050
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		⅝″ from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.07, ″.07, ″.08, ″.08, ″.11, ″.22*

No. 2966.

Marks, $\overset{10}{M}\ \overset{R_1}{T},\ \overset{C_4}{O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	.000017	.000017	
11,250	45,000	.001533	.000200	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001833	.000050	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001917	.000050	....	....	
14,000	56,000	.001950	.000033	....	....	
14,250	57,000	.002000	.000050	....	....	
14,500	58,000	.002033	.000033	....	....	Elastic limit.
14,750	59,000	.002100	.000067	....	....	
15,000	60,000	.002367	.000267	....	....	
15,250	61,000	.002933	.000566	....	....	
15,500	62,000	.003667	.000734	....	....	
16,000	64,000	.004933	.001266	....	....	
16,500	66,000	.006250	.001317	....	....	
17,000	68,000	.007583	.001333	....	....	
17,500	70,000	.008850	.001267	....	....	
18,000	72,000	.010250	.001400	....	....	
18,500	74,000	.011667	.001417	....	....	
19,000	76,000	.013083	.001366	....	....	
19,500	78,000	.014500	.001417	....	....	
20,000	80,000	.016000	.001500	....	....	
20,500	82,000	.017500	.001500	....	....	
21,000	84,000	.019350	.001850	....	....	
21,500	86,000	.021250	.001900	....	....	
22,000	88,000	.023167	.001917	....	....	
22,500	90,000	.025333	.002166	....	....	
23,000	92,000	.027500	.002167	....	....	
23,500	94,000	.029917	.002417	....	....	
24,000	96,000	.032500	.002583	....	....	
24,500	98,000	.0350	.0025	....	....	
25,000	100,000	.0367	.0017	....	....	
25,500	102,000	.0417	.0050	....	....	
26,000	104,000	.0467	.0050	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0600	.0083	....	....	
27,500	110,000	.0683	.0083	....	....	
28,000	112,000	.0883	.0200	....	....	
28,100	112,400	.1033	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	112,400
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1200
Elongation per inch under strain at elastic limit	do	.002033
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		".00 from neck
Character of broken surface		granular; silky eccentric spot
Elongation of inch sections		".23*, ".14, ".12, ".10, ".08, ".05

No. 2967.

Marks, $\genfrac{}{}{0pt}{}{10\ R_1\ C_4}{M\ T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000850	.000183	0.	....	
7,500	30,000	.001017	.000167	0.	....	
8,750	35,000	.001183	.000166	0.	....	
10,000	40,000	.001367	.000184	.000017	.000017	
11,250	45,000	.001533	.000166	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001833	.000050	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001950	.000050	....	....	Elastic limit.
14,250	57,000	.002050	.000100	....	....	
14,500	58,000	.003417	.001367	....	....	
14,750	59,000	.004500	.001083	....	....	
15,000	60,000	.005217	.000717	....	....	
15,500	62,000	.006500	.001283	....	....	
16,000	64,000	.007833	.001333	....	....	
16,500	66,000	.009333	.001500	....	....	
17,000	68,000	.010583	.001250	....	....	
17,500	70,000	.012000	.001417	....	....	
18,000	72,000	.013667	.001667	....	....	
18,500	74,000	.015250	.001583	....	....	
19,000	76,000	.016750	.001500	....	....	
19,500	78,000	.018333	.001583	....	....	
20,000	80,000	.020167	.001834	....	....	
20,500	82,000	.022167	.002000	....	....	
21,000	84,000	.024167	.002000	....	....	
21,500	86,000	.026000	.001833	....	....	
22,000	88,000	.028500	.002500	....	....	
22,500	90,000	.031250	.002750	....	....	
23,000	92,000	.033833	.002583	....	....	
23,500	94,000	.0367	.002867	....	....	
24,000	96,000	.0400	.0033	....	....	
24,500	98,000	.0417	.0017	....	....	
25,000	100,000	.0483	.0066	....	....	
25,500	102,000	.0567	.0084	....	....	
26,000	104,000	.0667	.0100	....	....	
26,500	106,000	.0800	.0183	....	....	
26,680	106,720	.1017	.0217	....	....	Tensile strength.

General summary.

Specific gravity.. 7.8533
Hardness.. 24.20
Tensile strength per square inch of original section....................pounds.. 106,720
Elastic limit per square inch of original section....................do.... 56,000
Elongation per inch after rupture....................inch.. 0.1033
Elongation per inch under strain at elastic limit....................do.... .001950
Reduction in diameter at point of rupture....................do.... .054
Reduction in area after rupture, per centum of original section.................... 18.8
Position of rupture....................2″ from neck
Character of broken surface....................granular, radiating from a dull spot at the circumference
Elongation of inch sections....................″.07, ″.10, ″.08, ″.13, ″.16*, ″.08

No .2972.

Marks, $^{10\,R_1\,C_4}_{M\,T_4\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000517	.000184	0.	....	
5, 000	20, 000	.000683	.000166	0.	....	
6, 250	25, 000	.000850	.000167	0.	....	
7, 500	30, 000	.001200	.000350	.000017	.000017	
8, 750	35, 000	.001367	.000167	.000017	0.	
10, 000	40, 000	.001550	.000183	.000017	0.	
11, 250	45, 000	.001717	.000167	....	....	
12, 500	50, 000	.001750	.000033	....	....	
12, 750	51, 000	.001750	0.	....	....	
13, 000	52, 000	.001783	.000033	....	....	
13, 250	53, 000	.001800	.000017	....	....	
13, 500	54, 000	.001833	.000033	....	....	
13, 750	55, 000	.001867	.000034	....	....	
14, 000	56, 000	.001933	.000066	....	....	
14, 250	57, 000	.001967	.000034	....	....	
14, 500	58, 000	.002000	.000033	....	....	
14, 750	59, 000	.002033	.000033	....	....	Elastic limit.
15, 000	60, 000	.002100	.000067	....	....	
15, 250	61, 000	.002433	.000333	....	....	
15, 500	62, 000	.003417	.000984	....	....	
16, 000	64, 000	.005167	.001750	....	....	
16, 500	66, 000	.006667	.001500	....	....	
17, 000	68, 000	.008000	.001333	....	....	
17, 500	70, 000	.009417	.001417	....	....	
18, 000	72, 000	.011083	.001666	....	....	
18, 500	74, 000	.012633	.001550	....	....	
19, 000	76, 000	.014083	.001450	....	....	
19, 500	78, 000	.015450	.001367	....	....	
20, 000	80, 000	.017167	.001717	....	....	
20, 500	82, 000	.019000	.001833	....	....	
21, 000	84, 000	.020833	.001833	....	....	
21, 500	86, 000	.022667	.001834	....	....	
22, 000	88, 000	.024700	.002033	....	....	
22, 500	90, 000	.027167	.002467	....	....	
23, 000	92, 000	.029500	.002333	....	....	
23, 500	94, 000	.0333	.0038	....	....	
24, 000	96, 000	.0367	.0034	....	....	
24, 500	98, 000	.0400	.0033	....	....	
25, 000	100, 000	.0433	.0033	....	....	
25, 500	102, 000	.0483	.0050	....	....	
26, 000	104, 000	.0550	.0067	....	....	
26, 500	106, 000	.0633	.0083	....	....	
27, 000	108, 000	.0750	.0117	....	....	
27, 440	109, 760	.1017	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 109, 760
Elastic limit per square inch of original section .... do ... 59, 000
Elongation per inch after rupture .... inch.. 0. 1230
Elongation per inch under strain at elastic limit .... do.... .00203
Reduction in diameter at point of rupture .... do.... .064
Reduction in area after rupture, per centum of original section 30. 6
Position of rupture .... 3″.1 from neck
Character of broken surface .... granular, 80 per cent.; silky, 20 per cent.
Elongation of inch sections .... ″.07, ″.10, ″.13, ″.26, ″.12, ″.07

No. 2973.

Marks, $^{10\,R_1\,C_4}_{M\,T_5\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000467	.000150	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001850	.000050	....	....	
14,000	56,000	.001900	.000050	....	....	
14,250	57,000	.001933	.000033	....	....	
14,500	58,000	.001983	.000050	....	....	Elastic limit.
14,750	59,000	.002050	.000067	....	....	
15,000	60,000	.003167	.001117	....	....	
15,500	62,000	.004617	.001450	....	....	
16,000	64,000	.006267	.001650	....	....	
16,500	66,000	.007833	.001566	....	....	
17,000	68,000	.009417	.001584	....	....	
17,500	70,000	.010833	.001416	....	....	
18,000	72,000	.012250	.001417	....	....	
18,500	74,000	.013833	.001583	....	....	
19,000	76,000	.015583	.001750	....	....	
19,500	78,000	.017500	.001917	....	....	
20,000	80,000	.019417	.001917	....	....	
20,500	82,000	.021133	.001716	....	....	
21,000	84,000	.022867	.001734	....	....	
21,500	86,000	.025200	.002333	....	....	
22,000	88,000	.027517	.002317	....	....	
22,500	90,000	.029917	.002400	....	....	
23,000	92,000	.0333	.003383	....	....	
23,500	94,000	.0367	.0034	....	....	
24,000	96,000	.0417	.0050	....	....	
24,500	98,000	.0450	.0033	....	....	
25,000	100,000	.0500	.0050	....	....	
25,500	102,000	.0550	.0050	....	....	
26,000	104,000	.0650	.0100	....	....	
26,500	106,000	.0783	.0133	....	....	
26,780	107,120	.1083	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	107,120
Elastic limit per square inch of original section	do....	58,000
Elongation per inch after rupture	inch..	0.1350
Elongation per inch under strain at elastic limit	do....	.001983
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		2″.80 from neck
Character of broken surface		granular, 80 per cent.; silky, 20 per cent.
Elongation of inch sections		″.07, ″.10, ″.13, ″.28*, ″.14, ″.09

HOOP C.

No. 2804.

Marks, $\substack{10\ R,\ C_5 \\ B\ T,\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117			
2, 500	10, 000	.000267	.000150			
3, 750	15, 000	.000433	.000166			
5, 000	20, 000	.000583	.000150	0.		
6, 250	25, 000	.000750	.000167			
7, 500	30, 000	.000917	.000167			
8, 750	35, 000	.001083	.000166			
10, 000	40, 000	.001250	.000167	0.		
11, 250	45, 000	.001400	.000150			
12, 500	50, 000	.001583	.000183			
12, 750	51, 000	.001600	.000017			
13, 000	52, 000	.001633	.000033			
13, 250	53, 000	.001667	.000034			
13, 500	54, 000	.001700	.000033			
13, 750	55, 000	.001733	.000033			
14, 000	56, 000	.001767	.000034			
14, 250	57, 000	.001800	.000033			
14, 500	58, 000	.001833	.000033			
14, 750	59, 000	.001867	.000034			
15, 000	60, 000	.001917	.000050			
15, 250	61, 000	.001933	.000016			
15, 500	62, 000	.001983	.000050			
15, 750	63, 000	.002017	.000034			
16, 000	64, 000	.002067	.000050			
16, 250	65, 000	.002083	.000016			Elastic limit.
16, 500	66, 000	.002367	.000284			
16, 750	67, 000	.002583	.000216			
17, 000	68, 000	.003083	.000500			
17, 250	69, 000	.004083	.001000			
17, 500	70, 000	.005750	.001667			
18, 000	72, 000	.007750	.002000			
18, 500	74, 000	.009083	.001333			
19, 000	76, 000	.010250	.001167			
19, 500	78, 000	.011583	.001333			
20, 000	80, 000	.012917	.001334			
20, 500	82, 000	.014417	.001500			
31, 000	84, 000	.015750	.001333			
21, 500	86, 000	.017250	.001500			
22, 000	88, 000	.019083	.001833			
22, 500	90, 000	.020750	.001667			
23, 000	92, 000	.022583	.001833			
23, 500	94, 000	.024583	.002000			
24, 000	96, 000	.026583	.002000			
24, 500	98, 000	.028917	.002334			
25, 000	100, 000	.032500	.003583			
25, 500	102, 000	.0350	.0025			
26, 000	104, 000	.0383	.0033			
26, 500	106, 000	.0417	.0034			
27, 000	108, 000	.0450	.0033			
27, 500	110, 000	.0500	.0050			
28, 000	112, 000	.0567	.0067			
28, 500	114, 000	.0667	.0100			
29, 000	116, 000	.0850	.0183			
29, 020	116, 080	.0900	.0050			Tensile strength.

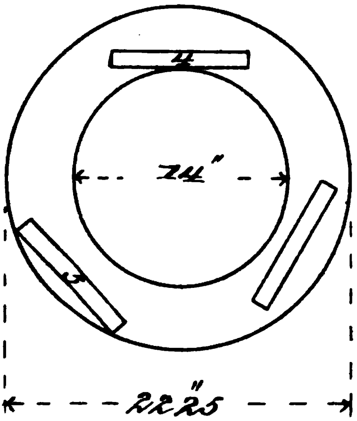
General summary.

Tensile strength per square inch of original section	pounds..	116, 080
Elastic limit per square inch of original section	do....	65, 000
Elongation per inch after rupture	inch..	0. 1033
Elongation per inch under strain at elastic limit	do....	.002083
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		".6 from neck
Character of broken surface		fine granular, radiating from a silky spot near center
Elongation of inch sections		".27*, ".06, ".06, ".06, ".07, ".06

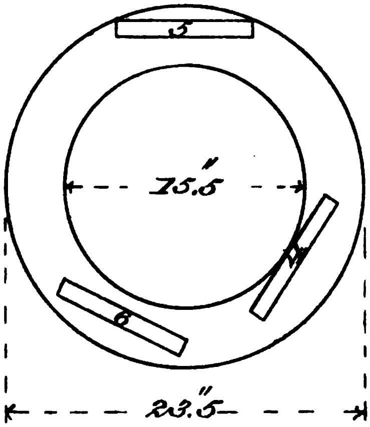
10 inch Steel B. L. Rifle

Hoop C5

Muzzle



Breech



No. 2805.

Marks, $^{10\ R_1\ C_6}_{B\ T_3\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117			
2, 500	10, 000	.000300	.000183			
3, 750	15, 000	.000467	.000167			
5, 000	20, 000	.000633	.000166	0.		
6, 250	25, 000	.000800	.000167			
7, 500	30, 000	.000967	.000167			
8, 750	35, 000	.001133	.000166			
10, 000	40, 000	.001300	.000167	0.		
11, 250	45, 000	.001467	.000167			
12, 500	50, 000	.001633	.000166			
12, 750	51, 000	.001667	.000034			
13, 000	52, 000	.001700	.000033			
13, 250	53, 000	.001733	.000033			
13, 500	54, 000	.001783	.000050			
13, 750	55, 000	.001800	.000017			
14, 000	56, 000	.001850	.000050			
14, 250	57, 000	.001883	.000033			
14, 500	58, 000	.001917	.000034			
14, 750	59, 000	.001950	.000033			
15, 000	60, 000	.001983	.000033			
15, 250	61, 000	.002017	.000034			
15, 500	62, 000	.002050	.000033			
15, 750	63, 000	.002067	.000017			
16, 000	64, 000	.002133	.000066			
16, 250	65, 000	.002150	.000017			
16, 500	66, 000	.002183	.000033			
16, 750	67, 000	.002217	.000034			Elastic limit.
17, 000	68, 000	.009300	.007083			
17, 250	69, 000	.009800	.000500			
17, 500	70, 000	.010467	.000667			
18, 000	72, 000	.011833	.001366			
18, 500	74, 000	.013333	.001500			
19, 000	76, 000	.014667	.001334			
19, 500	78, 000	.016333	.001666			
20, 000	80, 000	.017667	.001334			
20, 500	82, 000	.019500	.001833			
21, 000	84, 000	.021333	.001833			
21, 500	86, 000	.023167	.001834			
22, 000	88, 000	.025167	.002000			
22, 500	90, 000	.027500	.002333			
23, 000	92, 000	.029667	.002167			
23, 500	94, 000	.0333	.003633			
24, 000	96, 000	.0358	.0025			
24, 500	98, 000	.0383	.0025			
25, 000	100, 000	.0433	.0050			
25, 500	102, 000	.0467	.0034			
26, 000	104, 000	.0533	.0066			
26, 500	106, 000	.0600	.0067			
27, 000	108, 000	.0700	.0100			
27, 500	110, 000	.0883	.0183			
27, 690	110, 760	.1100	.0217			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	110, 760
Elastic limit per square inch of original section	do	67, 000
Elongation per inch after rupture	inch	0. 1533
Elongation per inch under strain at elastic limit	do	.002217
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		2″.85 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.09, ″.13, ″.35, ″.16, ″.11, ″.08

No. 2806.

Marks, $\substack{10\ R_1\ C_5 \\ B\ T_5\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100			
2,500	10,000	.000267	.000167			
3,750	15,000	.000438	.000166			
5,000	20,000	.000583	.000150	0.		
6,250	25,000	.000750	.000167			
7,500	30,000	.000917	.000167			
8,750	35,000	.001083	.000166			
10,000	40,000	.001250	.000167	0.		
11,250	45,000	.001400	.000150			
12,500	50,000	.001567	.000167			
12,750	51,000	.001600	.000033			
13,000	52,000	.001633	.000033			
13,250	53,000	.001667	.000034			
13,500	54,000	.001717	.000050			
13,750	55,000	.001733	.000016			
14,000	56,000	.001783	.000050			
14,250	57,000	.001817	.000034			
14,500	58,000	.001850	.000033			
14,750	59,000	.001883	.000033			
15,000	60,000	.001917	.000034			
15,250	61,000	.001950	.000033			
15,500	62,000	.001983	.000033			
15,750	63,000	.002033	.000050			
16,000	64,000	.002050	.000017			
16,250	65,000	.002083	.000033			
16,500	66,000	.002133	.000050			
16,750	67,000	.002167	.000034			
17,000	68,000	.002217	.000050			
17,250	69,000	.002250	.000033			
17,500	70,000	.002300	.000050			Elastic limit.
17,750	71,000	.008867	.006567			
18,000	72,000	.009500	.000633			
18,500	74,000	.010667	.001167			
19,000	76,000	.012167	.001500			
19,500	78,000	.013500	.001333			
20,000	80,000	.014833	.001333			
20,500	82,000	.016500	.001667			
21,000	84,000	.018167	.001667			
21,500	86,000	.019833	.001666			
22,000	88,000	.021500	.001667			
22,500	90,000	.023500	.002000			
23,000	92,000	.025333	.001833			
23,500	94,000	.027500	.002167			
24,000	96,000	.029167	.001667			
24,500	98,000	.0317	.002533			
25,000	100,000	.0350	.0033			
25,500	102,000	.0400	.0050			
26,000	104,000	.0433	.0033			
26,500	106,000	.0467	.0034			
27,000	108,000	.0533	.0066			
27,500	110,000	.0617	.0084			
28,000	112,000	.0683	.0066			
28,500	114,000	.0900	.0217			
28,620	114,480	.1100	.0200			Tensile strength.

General summary.

Specific gravity 7.8567
Hardness 24.96
Tensile strength per square inch of original section .... pounds.. 114,480
Elastic limit per square inch of original section .... do ... 70,000
Elongation per inch after rupture .... inch.. 0.1333
Elongation per inch under strain at elastic limit .... do.... .002300
Reduction in diameter at point of rupture .... do.... .104
Reduction in area after rupture, per centum of original section 33.5
Position of rupture .... 1″ from neck
Character of broken surface .... silky
Elongation of inch sections .... ″.08, ″.09, ″.10, ″.12, ″.17, ″.26

No. 2807.

Marks, $^{10\ R,\ C_5}_{M\ T,\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150			
2,500	10,000	.000317	.000167			
3,750	15,000	.000483	.000166			
5,000	20,000	.000650	.000167	0.		
6,250	25,000	.000800	.000150			
7,500	30,000	.000983	.000183			
8,750	35,000	.001133	.000150			
10,000	40,000	.001317	.000184	0.		
11,250	45,000	.001467	.000150			
12,500	50,000	.001633	.000166			
12,750	51,000	.001667	.000034			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001767	.000034			
13,750	55,000	.001800	.000033			
14,000	56,000	.001833	.000033			
14,250	57,000	.001867	.000034			
14,500	58,000	.001900	.000033			
14,750	59,000	.001933	.000033			
15,000	60,000	.001967	.000034			
15,250	61,000	.002017	.000050			
15,500	62,000	.002050	.000033			
15,750	63,000	.002083	.000033			
16,000	64,000	.002117	.000034			
16,250	65,000	.002150	.000033			
16,500	66,000	.002183	.000033			Elastic limit.
16,750	67,000	.006000	.003817			
17,000	68,000	.010500	.004500			
17,500	70,000	.011333	.000833			
18,000	72,000	.012833	.001500			
18,500	74,000	.014333	.001500			
19,000	76,000	.015833	.001500			
19,500	78,000	.017667	.001834			
20,000	80,000	.019333	.001666			
20,500	82,000	.021167	.001834			
21,000	84,000	.023167	.002000			
21,500	86,000	.025500	.002333			
22,000	88,000	.028000	.002500			
22,500	90,000	.030500	.002500			
23,000	92,000	.0333	.0028			
23,500	94,000	.0383	.0050			
24,000	96,000	.0417	.0034			
24,500	98,000	.0467	.0050			
25,000	100,000	.0533	.0066			
25,500	102,000	.0567	.0034			
26,000	104,000	.0650	.0083			
26,500	106,000	.0783	.0133			
26,810	107,240	.1067	.0284			Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 107,240
Elastic limit per square inch of original section ....do.... 66,000
Elongation per inch after rupture ....inch.. .01200
Elongation per inch under strain at elastic limit ....do.... .002183
Reduction in diameter at point of rupture ....do ... .114
Reduction in area after rupture, per centum of original section 3.64
Position of rupture ....″.65 from neck
Character of broken surface ....silky, interspersed with fine granulation
Elongation of inch sections ....″.31*, ″.10, ″.07, ″.06, ″.08, ″.10

No. 2808.

Marks, $^{10\ R_1\ C_6}_{M\ T_5\ O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	....	....	
2,500	10,000	.000250	.000133	....	....	
3,750	15,000	.000433	.000183	....	....	
5,000	20,000	.000583	.000150	0.	....	
6,250	25,000	.000750	.000167	....	....	
7,500	30,000	.000917	.000167	....	....	
8,750	35,000	.001083	.000166	....	....	
10,000	40,000	.001250	.000167	0.	....	
11,250	45,000	.001417	.000167	....	....	
12,500	50,000	.001600	.000183	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001650	.000017	....	....	
13,250	53,000	.001683	.000033	....	....	
13,500	54,000	.001717	.000034	....	....	
13,750	55,000	.001750	.000033	....	....	
14,000	56,000	.001783	.000033	....	....	
14,250	57,000	.001817	.000034	....	....	
14,500	58,000	.001850	.000033	....	....	
14,750	59,000	.001883	.000033	....	....	
15,000	60,000	.001917	,000034	....	....	
15,250	61,000	.001950	.000033	....	....	
15,500	62,000	.001983	.000033	....	....	
15,750	63,000	.002017	.000034	....	....	
16,000	64,000	.002050	.000033	....	....	
16,250	65,000	.002083	.000033	....	....	
16,500	66,000	.002117	.000034	....	....	
16,750	67,000	.002150	.000033	....	....	
17,000	68,000	.002183	.000033	....	....	Elastic limit.
17,250	69,000	.007333	.005150	....	....	
17,500	70,000	.008667	.001334	....	....	
18,000	72,000	.010167	.001500	....	....	
18,500	74,000	.011500	.001333	....	....	
19,000	76,000	.012833	.001333	....	....	
19,500	78,000	.014167	.001334	....	....	
20,000	80,000	.015667	.001500	....	....	
20,500	82,000	.017333	.001666	....	....	
21,000	84,000	.019000	.001667	....	....	
21,500	86,000	.020833	.001833	....	....	
22,000	88,000	.022833	.002000	....	....	
22,500	90,000	.024667	.001834	....	....	
23,000	92,000	.026833	.002166	....	....	
23,500	94,000	.029167	.002334	....	....	
24,000	96,000	.0333	.004133	....	....	
24,500	98,000	.0358	.0025	....	....	
25,000	100,000	.0400	.0042	....	....	
25,500	102,000	.0433	.0033	....	....	
26,000	104,000	.0483	.0050	....	....	
26,500	106,000	.0533	.0050	....	....	
27,000	108,000	.0600	.0067	....	....	
27,500	110,000	.0700	.0100	....	....	
28,000	112,000	.0917	.0217	....	....	
28,020	112,080	.1000	.0083	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	112,080
Elastic limit per square inch of original section	do ...	68,000
Elongation per inch after rupture	inch..	0.1283
Elongation per inch under strain at elastic limit	do....	.002183
Reduction in diameter at point of rupture	do ...	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1¾" from neck
Character of broken surface		silky
Elongation of inch sections		".05, ".06, ".09, ".12, ".32, ".13

No. 2809.

Marks, $\genfrac{}{}{0pt}{}{10\ \text{R, Cs}}{\text{M T. M}}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100			
2,500	10,000	.000250	.000150			
3,750	15,000	.000417	.000167			
5,000	20,000	.000600	.000183	0.		
6,250	25,000	.000767	.000167			
7,500	30,000	.000950	.000183			
8,750	35,000	.001100	.000150			
10,000	40,000	.001283	.000183	0.		
11,250	45,000	.001450	.000167			
12,500	50,000	.001600	.000150			
12,750	51,000	.001633	.000033			
13,000	52,000	.001700	.000067			
13,250	53,000	.001717	.000017			
13,500	54,000	.001750	.000033			
13,750	55,000	.001783	.000033			
14,000	56,000	.001817	.000034			
14,250	57,000	.001850	.000033			
14,500	58,000	.001883	.000033			
14,750	59,000	.001917	.000034			
15,000	60,000	.001950	.000033			
15,250	61,000	.001983	.000033			
15,500	62,000	.002017	.000034			
15,750	63,000	.002067	.000050			
16,000	64,000	.002100	.000033			
16,250	65,000	.002133	.000033			
16,500	66,000	.002183	.000050			Elastic limit.
16,750	67,000	.009000	.006817			
17,000	68,000	.009833	.000833			
17,500	70,000	.011333	.001500			
18,000	72,000	.012500	.001167			
18,500	74,000	.014000	.001500			
19,000	76,000	.015500	.001500			
19,500	78,000	.017000	.001500			
20,000	80,000	.018667	.001667			
20,500	82,000	.020667	.002000			
21,000	84,000	.022667	.002000			
21,500	86,000	.024833	.002166			
22,000	88,000	.027000	.002167			
22,500	90,000	.029500	.002500			
23,000	92,000	.032000	.002500			
23,500	94,000	.0367	.0047			
24,000	96,000	.0400	.0033			
24,500	98,000	.0433	.0033			
25,000	100,000	.0500	.0067			
25,500	102,000	.0533	.0033			
26,000	104,000	.0600	.0067			
26,500	106,000	.0700	.0100			
27,000	108,000	.0867	.0167			
27,140	108,560	.1067	.0200			Tensile strength.

General summary.

Specific gravity		7.8512
Hardness		23.30
Tensile strength per square inch of original section	pounds..	108,560
Elastic limit per square inch of original section	do....	66,000
Elongation per inch after rupture	inch..	0.1450
Elongation per inch under strain at elastic limit	do....	.002183
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		2''.4 from neck
Character of broken surface		silky
Elongation of inch sections		''.10, ''.25, ''.25, ''.12, ''.09, ''.06

HOOP C₈.

Exterior diameter, 20″.5.
Interior diameter, 13″.0.

No. 2851.

Marks, $^{10\ R_1\ C_8}_{M\ T_4\ I}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000317	.000167	0.		
3,750	15,000	.000483	.000166	0.		
5,000	20,000	.000650	.000167	0.		
6,250	25,000	.000817	.000167	0.		
7,500	30,000	.000983	.000166	0.		
8,750	35,000	.001150	.000167	0.		
10,000	40,000	.001317	.000167	0.		
11,250	45,000	.001467	.000150			
12,500	50,000	.001633	.000166			
12,750	51,000	.001683	.000050			
13,000	52,000	.001733	.000050			
13,250	53,000	.001767	.000034			
13,500	54,000	.001800	.000033			
13,750	55,000	.001833	.000033			
14,000	56,000	.001867	.000034			
14,250	57,000	.001900	.000033			
14,500	58,000	.001933	.000033			
14,750	59,000	.001967	.000034			
15,000	60,000	.001983	.000016			
15,250	61,000	.002017	.000034			
15,500	62,000	.002050	.000033			
15,750	63,000	.002083	.000033			
16,000	64,000	.002133	.000050			
16,250	65,000	.002150	.000017			
16,500	66,000	.002217	.000067			
16,750	67,000	.002250	.000033			Elastic limit.
17,000	68,000	.002367	.000117			
17,250	69,000	.002783	.000416			
17,500	70,000	.003533	.000750			
18,000	72,000	.005838	.002300			
18,500	74,000	.007750	.001917			
19,000	76,000	.009000	.001250			
19,500	78,000	.010350	.001350			
20,000	80,000	.011867	.001517			
20,500	82,000	.013417	.001550			
21,000	84,000	.015000	.001583			
21,500	86,000	.016583	.001583			
22,000	88,000	.018333	.001750			
22,500	90,000	.020000	.001667			
23,000	92,000	.021917	.001917			
23,500	94,000	.024000	.002083			
24,000	96,000	.026000	.002000			
24,500	98,000	.028333	.002333			
25,000	100,000	.030667	.002334			
25,500	102,000	.0333	.002633			
26,000	104,000	.0367	.0034			
26,500	106,000	.0417	.0050			
27,000	108,000	.0483	.0066			
27,500	110,000	.0517	.0034			
28,000	112,000	.0550	.0033			
28,500	114,000	.0667	.0117			
29,000	116,000	.0900	.0233			
29,040	116,160	.1017	.0117			Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 116,160
Elastic limit per square inch of original section..........do ... 67,000
Elongation per inch after rupture..........inch.. 0.1267
Elongation per inch under strain at elastic limit..........do.... .002250
Reduction in diameter at point of rupture..........do.... .144
Reduction in area after rupture, per centum of original section.......... 44.6
Position of rupture.......... ″.87 from neck
Character of broken surface..........fine granular; silky center
Elongation of inch sections..........″.10, ″.11, ″.10, ″.11, ″.12, ″.28

No. 2852.

Marks, $\genfrac{}{}{0pt}{}{10\ R,\ C_6}{M\ T,\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000317	.000184	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000650	.000167	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.000983	.000166	0.	....	
8, 750	35. 000	.001150	.000167	0.	....	
10, 000	40, 000	.001317	.000167	0.	....	
11, 250	45, 000	.001500	.000183	....	....	
12, 500	50, 000	.001667	.000167	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001767	.000067	....	....	
13, 250	53, 000	.001800	.000033	....	....	
13, 500	54, 000	.001833	.000033	....	....	
13, 750	55, 000	.001867	.000034	....	....	
14, 000	56, 000	.001917	.000050	....	....	
14, 250	57, 000	.001950	.000033	....	....	
14, 500	58, 000	.001983	.000033	....	....	
14, 750	59, 000	.002017	.000034	....	....	
15, 000	60, 000	.002050	.000033	....	....	
15, 250	61, 000	.002083	.000033	....	....	
15, 500	62, 000	.002133	.000050	....	....	
15, 750	63, 000	.002167	.000034	....	....	
16. 000	64, 000	.002183	.000016	....	....	
16, 250	65, 000	.002217	.000034	....	....	
16, 500	66, 000	.002300	.000083	....	....	
16, 750	67, 000	.002333	.000033	....	....	Elastic limit.
17, 000	68, 000	.002433	.000100	....	....	
17, 250	69, 000	.003050	.000617	....	....	
17, 500	70, 000	.004333	.001283	....	....	
18, 000	72, 000	.005850	.001517	....	....	
18, 500	74, 000	.007250	.001400	....	....	
19, 000	76, 000	.008667	.001417	....	....	
19. 500	78, 000	.009833	.001166	....	....	
20, 000	80, 000	.011250	.001417	....	....	
20, 500	82, 000	.012833	.001583	....	....	
21, 000	84, 000	.014367	.001534	....	....	
21, 500	86, 000	.015833	.001466	....	....	
22, 000	88, 000	.017333	.001500	....	....	
22, 500	90. 000	.019000	.001667	....	....	
23, 000	92, 000	.020667	.001667	....	....	
23, 500	94, 000	.022483	.001816	....	....	
24, 000	96, 000	.024333	.001850	....	....	
24, 500	98, 000	.026250	.001917	....	....	
25, 000	100, 000	.028667	.002417	....	....	
25, 500	102, 000	.030667	.002000	....	....	
26, 000	104, 000	.0333	.002633	....	....	
26, 500	106, 000	.0367	.0034	....	....	
27, 000	108, 000	.0400	.0033	....	....	
27, 500	110, 000	.0450	.0050	....	....	
28, 000	112, 000	.0500	.0050	....	....	
28, 500	114, 000	.0550	.0050	....	....	
29, 000	116, 008	.0650	.0100	....	....	
29. 500	118, 000	.0850	.0200	....	....	
29, 600	118, 400	.0983	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 118, 400
Elastic limit per square inch of original section ....do.... 67, 000
Elongation per inch after rupture..................................inch.. 0. 1300
Elongation per inch under strain at elastic limit ....do ... .002333
Reduction in diameter at point of rupture ....do.... .124
Reduction in area after rupture, per centum of original section.................................. 39. 2
Position of rupture .... 2″ from neck
Character of broken surface ....silky, interspersed with fine granulation
Elongation of inch sections ....″ 09, ″.29*, .″14, ″.10, ″.08, ″.08

No. 2853.

Marks, $^{10\,R_1\,C_6}_{M\,T_6\,M}$
Diameter, ".565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000163	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001483	.000150	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001733	.000050	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001883	.000050	....	....	
14,250	57,000	.001900	.000017	....	....	
14,500	58,000	.001950	.000050	....	....	
14,750	59,000	.001983	.000033	....	....	
15,000	60,000	.002000	.000017	....	....	
15,250	61,000	.002050	.000050	....	....	
15,500	62,000	.002117	.000067	....	....	
15,750	63,000	.002150	.000033	....	....	
16,000	64,000	.002183	.000033	....	....	
16,250	65,000	.002217	.000034	....	....	
16,500	66,000	.002267	.000050	....	....	
16,750	67,000	.002317	.000050	....	....	Elastic limit.
17,000	68,000	.003183	.000866	....	....	
17,250	69,000	.004700	.001517	....	....	
17,500	70,000	.005500	.000800	....	....	
18,000	72,000	.007000	.001500	....	....	
18,500	74,000	.008533	.001533	....	....	
19,000	76,000	.009833	.001300	....	....	
19,500	78,000	.011350	.001517	....	....	
20,000	80,000	.012700	.001350	....	....	
20,500	82,000	.014217	.001517	....	....	
21,000	84,000	.015667	.001450	....	....	
21,500	86,000	.017233	.001566	....	....	
22,000	88,000	.018667	.001434	....	....	
22,500	90,000	.020300	.001633	....	....	
23,000	92,000	.022183	.001800	....	....	
23,500	94,000	.024033	.001850	....	....	
24,000	96,000	.026000	.001967	....	....	
24,500	98,000	.028333	.002333	....	....	
25,000	100,000	.030667	.002334	....	....	
25,500	102,000	.0333	.002633	....	....	
26,000	104,000	.0367	.0034	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0450	.0050	....	....	
27,500	110,000	.0500	.0050	....	....	
28,000	112,000	.0550	.0050	....	....	
28,500	114,000	.0633	.0083	....	....	
29,000	116,000	.0767	.0134	....	....	
29,280	117,120	.0967	.0200	....	....	Tensile strength.

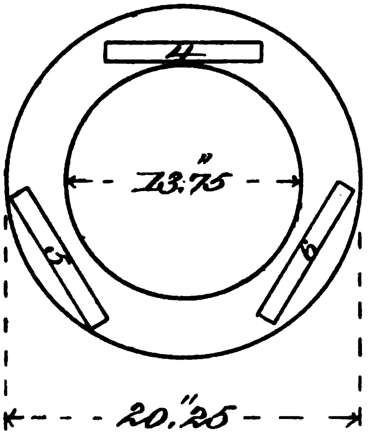
General summary.

Specific gravity		7.8593
Hardness		26.67
Tensile strength per square inch of original section	pounds..	117,120
Elastic limit per square inch of original section	do....	67,000
Elongation per inch after rupture	inch..	0.1067
Elongation per inch under strain at elastic limit	do....	.002317
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1".4 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		".12, " 26*, ".12, ".12, ".11, ".09

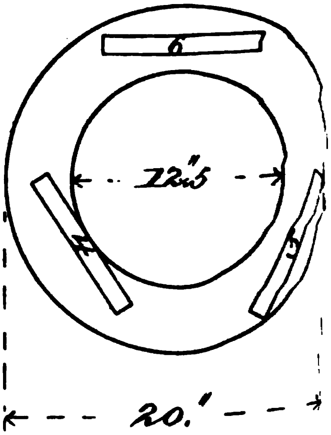
10 inch Steel B. L. Rifle

Hoop C 7

Breech



Muzzle



HOOP C_7.

No. 2791.

Marks, $\begin{smallmatrix}10\ R_1\ C_7\\ B\ T_4\ I\end{smallmatrix}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	—.000017	—.000017	
2,500	10,000	.000283	.000183	—.000017	0.	
3,750	15,000	.000433	.000150	—.000033	—.000016	
5,000	20,000	.000617	.000184	—.000033	0.	
6,250	25,000	.000783	.000166	—.000033	0.	
7,500	30,000	.000950	.000167	—.000033	0.	
8,750	35,000	.001117	.000167	—.000033	0.	
10,000	40,000	.001283	.000166	—.000033	0.	
11,250	45,000	.001433	.000150	....	....	
12,500	50,000	.001617	.000184	....	....	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001717	.000034	....	....	
13,500	54,000	.001750	.000033	....	....	
13,750	55,000	.001767	.000017	....	....	
14,000	56,000	.001817	.000050	....	....	
14,250	57,000	.001850	.000033	....	....	
14,500	58,000	.001883	.000033	....	....	
14,750	59,000	.001917	.000034	....	....	
15,000	60,000	.001967	.000050	....	....	
15,250	61,000	.002000	.000033	....	....	
15,500	62,000	.002050	.000050	....	....	
15,750	63,000	.002067	.000017	....	....	
16,000	64,000	.002117	.000050	....	....	
16,250	65,000	.002150	.000033	....	....	
16,500	66,000	.002200	.000050	....	....	
16,750	67,000	.002233	.000033	....	....	
17,000	66,000	.002317	.000084	....	....	
17,250	69,000	.002383	.000066	....	....	Elastic limit.
17,500	70,000	.002550	.000167	....	....	
17,750	71,000	.002717	.000167	....	....	
18,000	72,000	.003050	.000333	....	....	
18,500	74,000	.004717	.001667	....	....	
19,000	76,000	.006333	.001666	....	....	
10,500	78,000	.007883	.001550	....	....	
20,000	80,000	.009250	.001367	....	....	
20,500	82,000	.010883	.001633	....	....	
21,000	84,000	.012550	.001667	....	....	
21,500	86,000	.014217	.001667	....	....	
22,000	88,000	.015833	.001616	....	....	
22,500	90,000	.017833	.002000	....	....	
23,000	92,000	.019833	.002000	....	....	
23,500	94,000	.021667	.001834	....	....	
24,000	96,000	.0250	.003333	....	....	
24,500	98,000	.0283	.0033	....	....	
25,000	100,000	.0300	.0017	....	....	
25,500	102,000	.0333	.0033	....	....	
26,000	104,000	.0350	.0017	....	....	
26,500	106,000	.0400	.0050	....	....	
27,000	108,000	.0433	.0033	....	....	
27,500	110,000	.0483	.0050	....	....	
28,000	112,000	.0533	.0050	....	....	
28,500	114,000	.0633	.0100	....	....	
29,000	116,000	.0800	.0167	....	....	
29,190	116,760	.0953	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	116,760
Elastic limit per square inch of original section	do	69,000
Elongation per inch after rupture	inch	0.1083
Elongation per inch under strain at elastic limit	do	.002383
Reduction in diameter at point of rupture	do	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		″.6 from neck
Character of broken surface		granular
Elongation of inch sections		″.06, ″.09, ″.08, ″.09, ″.12, ″.21*

No. 2792.

Marks, $\overset{10\,R_1\,C_7}{B\,T_5\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000800	.000150	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001150	.000183	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001450	.000133	....	....	
12,500	50,000	.001667	.000217	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001783	.000050	....	....	
13,500	54,000	.001833	.000050	....	....	Elastic limit.
13,750	55,000	.001917	.000084	....	....	
14,000	56,000	.002117	.000200	....	....	
14,250	57,000	.002317	.000200	....	....	
14,500	58,000	.002750	.000433	....	....	
14,750	59,000	.002967	.000217	....	....	
15,000	60,000	.003467	.000500	....	....	
15,500	62,000	.004667	.001200	....	....	
16,000	64,000	.006000	.001333	....	....	
16,500	66,000	.007167	.001167	....	....	
17,000	68,000	.008500	.001333	....	....	
17,500	70,000	.010000	.001500	....	....	
18,000	72,000	.011500	.001500	....	....	
18,500	74,000	.013000	.001500	....	....	
19,000	76,000	.014500	.001500	....	....	
19,500	78,000	.016333	.001833	....	....	
20,000	80,000	.017667	.001334	....	....	
20,500	82,000	.019667	.002000	....	....	
21,000	84,000	.021333	.001666	....	....	
21,500	86,000	.023000	.001667	....	....	
22,000	88,000	.025000	.002000	....	....	
22,500	90,000	.0283	.0033	....	....	
23,000	92,000	.0317	.0034	....	....	
23,500	94,000	.0350	.0033	....	....	
24,000	96,000	.0383	.0033	....	....	
24,500	98,000	.0433	.0050	....	....	
25,000	100,000	.0467	.0034	....	....	
25,500	102,000	.0500	.0033	....	....	
26,000	104,000	.0567	.0067	....	....	
26,500	106,000	.0667	.0100	....	....	
27,000	108,000	.0833	.0166	....	....	
27,120	108,480	.0983	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,480
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.1167
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1⅛″ from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.06, ″.06, ″.08, ″.11, ″.26*, ″.13

No. 2793.

Marks, $\frac{10\ R_1\ C_7}{B\ T_6\ M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	—.000017	—.000017	
2,500	10,000	.000267	.000150	—.000033	—.000016	
3,750	15,000	.000433	.000166	—.000033	0.	
5,000	20,000	.000600	.000167	—.000033	0.	
6,250	25,000	.000767	.000167	—.009033	0.	
7,500	30,000	.000950	.000183	—.000033	0.	
8,750	35,000	.001100	.000150	—.000033	0.	
10,000	40,000	.001267	.000167	—.000050	—.000017	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001600	.000167	....	....	
12,750	51,000	.001617	.000017	....	....	
13,000	52,000	.001667	.000050	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001750	.000050	....	....	
13,750	55,000	.001783	.000033	....	....	
14,000	56,000	.001817	.090034	....	....	
14,250	57,000	.001850	.000633	....	....	
14,500	58,000	.001883	.000033	....	....	
14,750	59,000	.001917	.000034	....	....	
15,000	60,000	.001950	.000033	....	....	
15,250	61,000	.001983	.000033	....	....	
15,500	62,000	.002033	.000050	....	....	
15,750	63,000	.002067	.000034	....	....	
16,000	64,000	.002117	.000050	....	....	
16,250	65,000	.002167	.000050	....	....	
16,500	66,000	.002233	.000066	....	....	Elastic limit.
16,750	67,000	.002333	.000100	....	....	
17,000	68,000	.002533	.000200	....	....	
17,250	69,000	.002767	.000234	....	....	
17,500	70,000	.003167	.000400	....	....	
18,000	72,000	.004500	.001333	....	....	
18,500	74,000	.006167	.001667	....	....	
19,000	76,000	.007667	.001500	....	....	
19,500	78,000	.009000	.001333	....	....	
20,000	80,000	.010667	.001667	....	....	
20,500	82,000	.012167	.001500	....	....	
21,000	84,000	.013333	.001166	....	....	
21,500	86,000	.015167	.001834	....	....	
22,000	88,000	.016667	.001500	....	....	
22,500	90,000	.018667	.002000	....	....	
23,000	92,000	.020500	.001833	....	....	
23,500	94,000	.022500	.002000	....	....	
24,000	96,000	.024500	.002000	....	....	
24,500	98,000	.026500	.002000	....	....	
25,000	100,000	.0300	.0035	....	....	
25,500	102,000	.0333	.0033	....	....	
26,000	104,000	.0367	.0034	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0450	.0050	....	....	
27,500	110,000	.0500	.0050	....	....	
28,000	112,000	.0550	.0050	....	....	
28,500	114,000	.0650	.0100	....	....	
29,000	116,000	.0783	.0133	....	....	
29,260	117,040	.1083	.0300	....	....	Tensile strength.

General summary.

Specific gravity 7.8452

Hardness 27.16

Tensile strength per square inch of original section .... pounds.. 117,040

Elastic limit per square inch of original seciion .... do.... 66,000

Elongation per inch after rupture .... inch.. 0.1250

Elongation per inch under strain at elastic limit .... do.. .002233

Reduction in diameter at point of rupture .... do.. .074

Reduction in area after rupture, per centum of original section 24.6

Position of rupture .... ″.7 from neck

Character of broken surface .... granular, radiating from a dull spot at circumference

Elongation of inch sections .... ″.22, ″.12, ″.09, ″.11, ″.11, ″.10

No. 2951

Marks, $\substack{10\ R_1\ C_7 \\ B\ T,\ I}$
Diameter, ″564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000300	.000200	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001667	.000200	....	....	
13, 750	55, 000	.001833	.000166	....	....	
15, 000	60, 000	.002000	.000167	....	....	
15, 250	61, 000	.002033	.000033	....	....	
15, 500	62, 000	.002067	.000034	....	....	
15, 750	63, 000	.002067	0.	....	....	
16, 000	64, 000	.002133	.000066	....	....	
16, 250	65, 000	.002167	.000034	....	....	
16, 500	66, 000	.002238	.000066	....	....	
16, 750	67, 000	.002267	.000034	....	....	
17, 000	68, 000	.002333	.000066	....	....	
17, 250	69, 000	.002367	.000034	....	....	
17, 500	70, 000	.002433	.000066	....	....	Elastic limit.
17, 750	71, 000	.002567	.000134	....	....	
18, 000	72, 000	.002833	.000266	....	....	
18. 250	73, 000	.003267	.000434	....	....	
18, 500	74, 000	.004167	.000900	....	....	
18, 750	75, 000	.005067	.000900	....	....	
19, 000	76, 000	.006067	.001000	....	....	
19, 500	78, 000	.008000	.001933	....	....	
20, 000	80, 000	.010000	.002000	....	....	
20, 500	82, 000	.011767	.001767	....	....	
21, 000	84, 000	.013400	.001633	....	....	
21, 500	86, 000	.015000	.001600	....	....	
22, 000	88, 000	.017100	.002100	....	....	
22, 500	90, 000	.019000	.001900	....	....	
23, 000	92, 000	.020667	.001667	....	....	
23, 500	94 400	.022833	.002166	....	....	
24, 000	96, 000	.024833	.002000	....	....	
24, 500	98, 000	.027367	.002534	....	....	
25, 000	100, 000	.030000	.002633	....	....	
25, 500	102. 000	.032567	.002567	....	....	
26, 000	104, 000	.036000	.003433	....	....	
26, 500	106, 000	.0400	.0010	....	....	
27, 000	108, 000	.0433	.0033	....	....	
27, 500	100. 000	.0500	.0067	....	....	
28, 000	112, 000	.0600	.0100	....	....	
28, 500	114, 000	.0700	.0100	....	....	
28, 930	115, 720	.1033	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 115, 720
Elastic limit per square inch of original section..............................do.... 70, 000
Elongation per inch after rupture..............................inch.. 0. 1600
Elongation per inch under strain at elastic limit..............................do.... .002433
Reduction in diameter at point of rupture..............................do.... .114
Reduction in area after rupture, per centum of original section 36.4
Position of rupture..............................″. 75 from neck
Character of broken surface..............................granular; silky center
Elongation of inch sections ....″. 08, ″. 11, ″. 29

No. 2952.

Marks, $\frac{10\ R_1\ C_7}{B\ T_3\ M}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	0.	....	
11,250	45,000	.001467	.000134	....	....	
12,500	50,000	.001667	.000200	....	....	
13,750	55,000	.001800	.000133	....	....	
15,000	60,000	.002000	.000200	....	....	
15,250	61,000	.002033	.000033	....	....	
15,500	62,000	.002067	.000034	....	....	
15,750	63,000	.002100	.000033	....	....	
16,000	64,000	.002133	.000033	....	....	
16,250	65,000	.002167	.000034	....	....	
16,500	66,000	.002233	.000066	....	....	
16,750	67,000	.002267	.000034	....	....	
17,000	68,000	.002300	.000033	....	....	
17,250	69,000	.002367	.000067	....	....	Elastic limit.
17,500	70,000	.002633	.000266	....	....	
17,750	71,000	.002900	.000267	....	....	
18,000	72,000	.003567	.000667	....	....	
18,250	73,000	.004100	.000533	....	....	
18,500	74,000	.005200	.001100	....	....	
19,000	76,000	.007400	.002200	....	....	
19,500	78,000	.009267	.001867	....	....	
20,000	80,000	.010933	.001666	....	....	
20,500	82,000	.012667	.001734	....	....	
21,000	84,000	.014333	.001666	....	....	
21,500	86,000	.016167	.001834	....	....	
22,000	88,000	.018000	.001833	....	....	
22,500	90,000	.020000	.002000	....	....	
23,000	92,000	.022000	.002000	....	....	
23,500	94,000	.024333	.002333	....	....	
24,000	96,000	.026500	.002167	....	....	
24,500	98,000	.029167	.002667	....	....	
25,000	100,000	.031867	.002700	....	....	
25,500	102,000	.035333	.003466	....	....	
26,000	104,000	.038833	.003500	....	....	
26,500	106,000	.0433	.004467	....	....	
27,000	108,000	.0467	.0034	....	....	
27,500	110,000	.0533	.0066	....	....	
28,000	112,000	.0667	.0134	....	....	
28,500	114,000	.0933	.0266	....	....	
28,540	114,160	.1033	.0100	....	....	Tensile strength.

General summary.

Specific gravity	7.8483
Hardness	24.26
Tensile strength per square inch of original section ... pounds	114,160
Elastic limit per square inch of original section ... do	69,000
Elongation per inch after rupture ... inch	0.1667
Elongation per inch under strain at elastic limit ... do	.002367
Reduction in diameter at point of rupture ... do	.115
Reduction in area after rupture, per centum of original section	36.4
Position of rupture	1″ from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.09, ″.16, .″25*

No. 2794.

Marks, ${}^{10\,R\,C}_{M\,T_4\,1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	0.	....	
3, 750	15, 000	.000400	.000167	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001250	.000183	0.	....	
11, 250	45, 000	.001400	.000150	....	....	
12, 500	50, 000	.001567	.000167	....	....	
12, 750	51, 000	.001600	.000033	....	....	
13, 000	52, 000	.001650	.000050	....	....	
13, 250	53, 000	.001667	.000017	....	....	
13, 500	54, 000	.001717	.000050	....	....	
13, 750	55, 000	.001750	.000033	....	....	
14, 000	56, 000	.001783	.000033	....	....	
14, 250	57, 000	.001817	.000034	....	....	
14, 500	58, 000	.001833	.000016	....	....	
14, 750	59, 050	.001867	.000034	....	....	
15, 000	60, 000	.001917	.000050	....	....	
15, 250	61, 000	.001950	.000033	....	....	
15, 500	62, 000	.002000	.000050	....	....	
15, 750	63, 000	.002033	.000033	....	....	
16, 000	64, 000	.002067	.000034	....	....	
16, 250	65, 000	.002100	.000033	....	....	
16, 500	66, 000	.002150	.000050	....	....	
16, 750	67, 000	.002200	.000050	....	....	Elastic limit
17, 000	68, 000	.002267	.000067	....	....	
17, 250	69, 000	.002350	.000083	....	....	
17, 500	70, 000	.002500	.000150	....	....	
17, 750	71, 000	.002633	.000133	....	....	
18, 000	72, 000	.002833	.000200	....	....	
18, 250	73, 000	.003067	.000234	....	....	
18, 500	74, 000	.003433	.000366	....	....	
19, 000	76, 000	.004500	.001067	....	....	
19, 500	78, 000	.005833	.001333	....	....	
20, 000	80, 000	.007667	.001834	....	....	
• 20, 500	82, 000	.008583	.000916	....	....	
21, 000	84, 000	.010833	.002250	....	....	
21, 500	86, 000	.012500	.001667	....	....	
22, 000	88, 000	.014000	.001500	....	....	
22, 500	90, 000	.015667	.001667	....	....	
23, 000	92, 000	.017333	.001666	....	....	
23, 500	94, 000	.019000	.001667	....	....	
24, 000	96, 000	.021000	.002000	....	....	
24, 500	98, 000	.023000	.002000	....	....	
25, 000	100, 000	.025000	.002000	....	....	
25, 500	102, 000	.027333	.002333	....	....	
26, 000	104, 000	.0300	.002667	....	....	
26, 500	106, 000	.0333	.0033	....	....	
27, 000	108, 000	.0367	.0034	....	....	
27, 500	110, 000	.0417	.0050	....	....	
28, 000	112, 000	.0450	.0033	....	....	
28, 500	114, 000	.0500	.0050	....	....	
29, 000	116, 000	.0583	.0083	....	....	
29, 500	128, 000	.0683	.0100	....	....	
29, 820	119, 280	.0850	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	119, 280
Elastic limit per square inch of original section	do	67, 000
Elongation per inch after rupture	inch	0. 0967
Elongation per inch under strain at elastic limit	do	.002200
Reduction in diameter at point of rupture	do	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.7 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.20*, ″.09, ″.07, ″.06, ″.07, ″.09

No. 2795.

Marks, $\overset{10\ R_1\ C_7}{M\ T_3\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000283	.000150	0.		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000617	.000167	0.		
6,250	25,000	.000783	.000166	0.		
7,500	30,000	.000950	.000167	0.		
8,750	35,000	.001133	.000183	0.		
10,000	40,000	.001300	.000167	.000017	.000017	
11,250	45,000	.001467	.000167			
12,500	50,000	.001633	.000166			
12,750	51,000	.001667	.000034			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001767	.000034			
13,750	55,000	.001800	.000033			
14,000	56,000	.001850	.000050			
14,250	57,000	.001867	.000017			
14,500	58,000	.001900	.000033			
14,750	59,000	.001933	.000033			
15,000	60,000	.001967	.000034			
15,250	61,000	.002000	.000033			
15,500	62,000	.002033	.000033			
15,750	63,000	.002067	.000034			
16,000	64,000	.002117	.000050			
16,250	65,000	.002150	.000033			
16,500	66,000	.002200	.000050			
16,750	67,000	.002233	.000033			
17,000	68,000	.002283	.000050			
17,250	69,000	.002333	.000050			Elastic limit.
17,500	70,000	.002417	.000084			
17,750	71,000	.002517	.000100			
18,000	72,000	.002750	.000233			
18,250	73,000	.003033	.000283			
18,500	74,000	.003567	.000534			
19,000	76,000	.005667	.002100			
19,500	78,000	.007333	.001666			
20,000	80,000	.008500	.001167			
20,500	82,000	.010333	.001833			
21,000	84,000	.011833	.001500			
21,500	86,000	.013500	.001667			
22,000	88,000	.015167	.001667			
22,500	90,000	.016833	.001666			
23,000	92,000	.018667	.001834			
23,500	94,000	.020500	.001833			
24,000	96,000	.022500	.002000			
24,500	98,000	.024667	.002167			
25,000	100,000	.026833	.002166			
25,500	102,000	.0300	.003167			
26,000	104,000	.0333	.0033			
26,500	106,000	.0367	.0034			
27,000	108,000	.0400	.0033			
27,500	110,000	.0450	.0050			
28,000	112,000	.0500	.0050			
28,500	114,000	.0567	.0067			
29,000	116,000	.0667	.0100			
29,480	117,920	.1033	.0366			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	117,920
Elastic limit per square inch of original section	do....	69,000
Elongation per inch after rupture	inch..	0.1350
Elongation per inch under strain at elastic limit	do....	.002333
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		2″ from neck
Character of broken surface		granular, radiating from a dull spot at circumference
Elongation of inch sections		″.10, ″.17*, ″.15, ″.14, ″.15, ″.10

No. 2796.

Marks, $\overset{10\ R_1\ C_7}{M\ T_8\ M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000633	.000183	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001117	.000150	0.	....	
10,000	40,000	.001283	.000166	0.	....	
11,250	45,000	.001450	.000167	....	....	
12,500	50,000	.001650	.000200	....	....	
12,750	51,000	.001667	.000017	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001783	.000016	....	....	
14,000	56,000	.001833	.000050	....	....	
14,250	57,000	.001850	.000017	....	....	
14,500	58,000	.001883	.000033	....	....	
14,750	59,000	.001933	.000050	....	....	
15,000	60,000	.001967	.000034	....	....	
15,250	61,000	.002000	.000033	....	....	
15,500	62,000	.002033	.000033	....	....	
15,750	63,000	.002067	.000034	....	....	
16,000	64,000	.002100	.000033	....	....	
16,250	65,000	.002133	.000033	....	....	
16,500	66,000	.002183	.000050	....	....	
16,750	67,000	.002217	.000034	....	....	
17,000	68,000	.002267	.000050	....	....	
17,250	69,000	.002317	.000050	....	....	Elastic limit.
17,500	70,000	.002400	.000083	....	....	
17,750	71,000	.002500	.000100	....	....	
18,000	72,000	.002650	.000150	....	....	
18,250	73,000	.002850	.000200	....	....	
18,500	74,000	.003333	.000483	....	....	
19,000	76,000	.004833	.001500	....	....	
19,500	78,000	.006333	.001500	....	....	
20,000	80,000	.007833	.001500	....	....	
20,500	82,000	.009333	.001500	....	....	
21,000	84,000	.011000	.001667	....	....	
21,500	86,000	.012500	.001500	....	....	
22,000	88,000	.014167	.001667	....	....	
22,500	90,000	.015833	.001666	....	....	
23,000	92,000	.017500	.001667	....	....	
23,500	94,000	.019333	.001833	....	....	
24,000	96,000	.021000	.001667	....	....	
24,500	98,000	.023167	.002167	....	....	
25,000	100,000	.025500	.002333	....	....	
25,500	102,000	.027500	.002000	....	....	
26,000	104,000	.030167	.002667	....	....	
26,500	106,000	.0333	.003133	....	....	
27,000	108,000	.0367	.0034	....	....	
27,500	110,000	.0417	.0050	....	....	
28,000	112,000	.0450	.0033	....	....	
28,500	114,000	.0500	.0050	....	....	
29,000	116,000	.0583	.0083	....	....	
29,500	118,000	.0700	.0117	....	....	
29,870	119,480	.1017	.0317	....	....	Tensile strength.

General summary.

Specific gravity	7.8437
Hardness	28.13
Tensile strength per square inch of original section ... pounds	119,480
Elastic limit per square inch of original section ... do	69,000
Elongation per inch after rupture ... inch	0.1183
Elongation per inch under strain at elastic limit ... do	.002317
Reduction in diameter at point of rupture ... do	.064
Reduction in area after rupture, per centum of original section	21.4
Position of rupture	1″.50 from neck
Character of broken surface	granular, radiating from a dull spot at circumference
Elongation of inch sections	″.10, ″.08, ″.08, ″.20, ″.24, ″.11

No. 2953.

Marks, $^{10\ R_1\ C_7}_{M\ T_7\ 1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000967	.000184	0.	....	
8,750	35.000	.001133	.000166	0.	....	
10,000	40.000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
13,750	55,000	.001817	.000184	....	....	
15,000	60.000	.002000	.000183	....	....	
15,250	61,000	.002033	.000033	....	....	
15.500	62.000	.002067	.000034	....	....	
15.750	63.000	.002100	.000033	....	....	
16,000	64,000	.002133	.000033	....	....	
16.250	65.000	.002167	.000034	....	....	
16,500	66,000	.002217	.000050	....	....	
16,750	67.000	.002267	.000050	....	....	
17,000	68 000	.002300	.000033	....	....	
17.250	69,000	.002338	.000038	....	....	
17.500	70,000	.002367	.000034	....	....	
17,750	71,000	.002400	.000033	....	....	
18.000	72,000	.002433	.000033	....	....	Elastic limit.
18.250	73,000	.002667	.000234	....	....	
18,500	74.000	.002750	.000083	....	....	
18,750	75.000	.002800	.000050	....	....	
19,000	76,000	.002867	.000067	....	....	
19,250	77,000	.003167	.000300	....	....	
19,500	78.000	.003667	.000500	....	....	
19,750	79.000	.004167	.000500	....	....	
20,000	80.000	.005417	.001250	....	....	
20,500	82.000	.007367	.001950	....	....	
21,000	84.000	.009500	.002133	....	....	
21,500	86,000	.011583	.002083	....	....	
22.000	88.000	.013450	.001867	....	....	
22,500	90.000	.015283	.001833	....	....	
23,000	92,000	.017283	.002000	....	....	
23 500	94.000	.019417	.002134	....	....	
24,000	96 000	.021333	.001916	....	....	
24,500	98,000	.0233	.001967	....	....	
25,000	100,000	.0267	.0034	....	....	
25,500	102,000	.0300	.0033	....	....	
26 000	104,000	.0333	.0033	....	....	
26,500	106,000	.0367	.0034	....	....	
27,000	108,000	.0400	.0033	....	....	
27.500	110,000	.0450	.0050	....	....	
28,000	112,000	.0517	.0067	....	....	
28,500	114,000	.0600	.0083	....	....	
29,000	116,000	.0767	.0167	....	....	
29,160	116,640	.0933	.0166	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 116,640
Elastic limit per square inch of original section...do ... 72,000
Elongation per inch after rupture...inch.. 0.1350
Elongation per inch under strain at elastic limit...do.... .002433
Reduction in diameter at point of rupture ....do.... .134
Reduction in area after rupture, per centum of original section 41 9
Position of rupture...1″ from neck
Character of broken surface...silky, interspersed with granular metal
Elongation of inch sections ....″.12, ″.11, ″.08, ″.08, ″.13, ″.29*

No. 2792.

Marks, $\genfrac{}{}{0pt}{}{10\ R_1\ C_7}{B\ T_3\ O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000800	.000150	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001150	.000183	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001450	.000133	....	....	
12,500	50,000	.001667	.000217	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001783	.000050	....	....	
13,500	54,000	.001833	.000050	....	....	Elastic limit.
13,750	55,000	.001917	.000084	....	....	
14,000	56,000	.002117	.000200	....	....	
14,250	57,000	.002317	.000200	....	....	
14,500	58,000	.002750	.000433	....	....	
14,750	59,000	.002967	.000217	....	....	
15,000	60,000	.003467	.000500	....	....	
15,500	62,000	.004667	.001200	....	....	
16,000	64,000	.006000	.001333	....	....	
16,500	66,000	.007167	.001167	....	....	
17,000	68,000	.008500	.001333	....	....	
17,500	70,000	.010000	.001500	....	....	
18,000	72,000	.011500	.001500	....	....	
18,500	74,000	.013000	.001500	....	....	
19,000	76,000	.014500	.001500	....	....	
19,500	78,000	.016333	.001833	....	....	
20,000	80,000	.017667	.001334	....	....	
20,500	82,000	.019667	.002000	....	....	
21,000	84,000	.021333	.001666	....	....	
21,500	86,000	.023000	.001667	....	....	
22,000	88,000	.025000	.002000	....	....	
22,500	90,000	.0283	.0033	....	....	
23,000	92,000	.0317	.0034	....	....	
23,500	94,000	.0350	.0033	....	....	
24,000	96,000	.0383	.0033	....	....	
24,500	98,000	.0433	.0050	....	....	
25,000	100,000	.0467	.0034	....	....	
25,500	102,000	.0500	.0033	....	....	
26,000	104,000	.0567	.0067	....	....	
26,500	106,000	.0667	.0100	....	....	
27,000	108,000	.0833	.0166	....	....	
27,120	108,480	.0983	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 108,480
Elastic limit per square inch of original section..........do.... 54,000
Elongation per inch after rupture..........inch.. 0.1167
Elongation per inch under strain at elastic limit..........do.... .001833
Reduction in diameter at point of rupture..........do.... .094
Reduction in area after rupture, per centum of original section.......... 30.6
Position of rupture..........1⅛″ from neck
Character of broken surface..........granular; silky center
Elongation of inch sections..........″.06, ″.06, ″.08, ″.11, ″.26*, ″.13

No. 2793.

Marks, $^{10\,R_1\,C_7}_{B\,T_8\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	—.000017	—.000017	
2,500	10,000	.000267	.000150	—.000033	—.000016	
3,750	15,000	.000433	.000166	—.000033	0.	
5,000	20,000	.000600	.000167	—.000033	0.	
6,250	25,000	.000767	.000167	—.009033	0.	
7,500	30,000	.000950	.000183	—.000033	0.	
8,750	35,000	.001100	.000150	—.000033	0.	
10,000	40,000	.001267	.000167	—.000050	—.000017	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001600	.000167	....	....	
12,750	51,000	.001617	.000017	....	....	
13,000	52,000	.001667	.000050	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001750	.000050	....	....	
13,750	55,000	.001783	.000033	....	....	
14,000	56,000	.001817	.090034	....	....	
14,250	57,000	.001850	.000633	....	....	
14,500	58,000	.001883	.000033	....	....	
14,750	59,000	.001917	.000034	....	....	
15,000	60,000	.001950	.000033	....	....	
15,250	61,000	.001983	.000033	....	....	
15,500	62,000	.002033	.000050	....	....	
15,750	63,000	.002067	.000034	....	....	
16,000	64,000	.002117	.000050	....	....	
16,250	65,000	.002167	.000050	....	....	
16,500	66,000	.002233	.000066	....	....	Elastic limit.
16,750	67,000	.002333	.000100	....	....	
17,000	68,000	.002533	.000200	....	....	
17,250	69,000	.002767	.000234	....	....	
17,500	70,000	.003167	.000400	....	....	
18,000	72,000	.004500	.001333	....	....	
18,500	74,000	.006167	.001667	....	....	
19,000	76,000	.007667	.001500	....	....	
19,500	78,000	.009000	.001333	....	....	
20,000	80,000	.010667	.001667	....	....	
20,500	82,000	.012167	.001500	....	....	
21,000	84,000	.013333	.001166	....	....	
21,500	86,000	.015167	.001834	....	....	
22,000	88,000	.016667	.001500	....	....	
22,500	90,000	.018667	.002000	....	....	
23,000	92,000	.020500	.001833	....	....	
23,500	94,000	.022500	.002000	....	....	
24,000	96,000	.024500	.002000	....	....	
24,500	98,000	.026500	.002000	....	....	
25,000	100,000	.0300	.0035	....	....	
25,500	102,000	.0333	.0033	....	....	
26,000	104,000	.0367	.0034	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0450	.0050	....	....	
27,500	110,000	.0500	.0050	....	....	
28,000	112,000	.0550	.0050	....	....	
28,500	114,000	.0650	.0100	....	....	
29,000	116,000	.0783	.0133	....	....	
29,260	117,040	.1083	.0300	....	....	Tensile strength.

General summary.

Specific gravity		7.8452
Hardness		27.16
Tensile strength per square inch of original section	pounds..	117,040
Elastic limit per square inch of original section	do....	66,000
Elongation per inch after rupture	inch..	0.1250
Elongation per inch under strain at elastic limit	do..	.002233
Reduction in diameter at point of rupture	do..	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.7 from neck
Character of broken surface		granular, radiating from a dull spot at circumference
Elongation of inch sections		″.22, ″.12, ″.09, ″.11, ″.11, ″.10

No. 2951

Marks, $^{10\,R_1\,C_7}_{B\,T,\,I}$
Diameter, ″564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001667	.000200	....	....	
13,750	55,000	.001833	.000166	....	....	
15,000	60.000	.002000	.000167	....	....	
15,250	61,000	.002033	.000033	....	....	
15,500	62,000	.002067	.000034	....	....	
15,750	63,000	.002067	0.	....	....	
16,000	64,000	.002133	.000066	....	....	
16,250	65,000	.002167	.000034	....	....	
16,500	66,000	.002238	.000066	....	....	
16,750	67,000	.002267	.000034	....	....	
17,000	68,000	.002333	.000066	....	....	
17,250	69,000	.002367	.000034	....	....	
17,500	70,000	.002433	.000066	....	....	Elastic limit.
17,750	71,000	.002567	.000134	....	....	
18,000	72,000	.002833	.000266	....	....	
18.250	73,000	.003267	.000434	....	....	
18,500	74,000	.004167	.000900	....	....	
18,750	75,000	.005067	.000900	....	....	
19,000	76,000	.006067	.001000	....	....	
19,500	78,000	.008000	.001933	....	....	
20,000	80,000	.010000	.002000	....	....	
20,500	82,000	.011767	.001767	....	....	
21,000	84,000	.013400	.001633	....	....	
21,500	86,000	.015000	.001600	....	....	
22,000	88,000	.017100	.002100	....	....	
22,500	90,000	.019000	.001900	....	....	
23,000	92,000	.020667	.001667	....	....	
23,500	94 400	.022833	.002166	....	....	
24,000	96,000	.024833	.002000	....	....	
24,500	98,000	.027367	.002534	....	....	
25,000	100,000	.030000	.002633	....	....	
25,500	102,000	.032567	.002567	....	....	
26,000	104,000	.036000	.003433	....	....	
26,500	106,000	.0400	.0040	....	....	
27,000	108,000	.0433	.0033	....	....	
27,500	100 000	.0500	.0067	....	....	
28,000	112,000	.0600	.0100	....	....	
28,500	114,000	.0700	.0100	....	....	
28,930	115,720	.1033	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	115,720
Elastic limit per square inch of original section	do	70,000
Elongation per inch after rupture	inch	0.1000
Elongation per inch under strain at elastic limit	do	.002433
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.75 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.11, ″.29

No. 2952.

Marks, $^{10\ R_1\ C_7}_{B\ T_2\ M}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	0.	....	
11,250	45,000	.001467	.000134	....	....	
12,500	50,000	.001667	.000200	....	....	
13,750	55,000	.001800	.000133	....	....	
15,000	60,000	.002000	.000200	....	....	
15,250	61,000	.002033	.000033	....	....	
15,500	62,000	.002067	.000034	....	....	
15,750	63,000	.002100	.000033	....	....	
16,000	64,000	.002133	.000033	....	....	
16,250	65,000	.002167	.000034	....	....	
16,500	66,000	.002233	.000066	....	....	
16,750	67,000	.002267	.000034	....	....	
17,000	68,000	.002300	.000033	....	....	
17,250	69,000	.002367	.000067	....	....	Elastic limit.
17,500	70,000	.002633	.000266	....	....	
17,750	71,000	.002900	.000267	....	....	
18,000	72,000	.003567	.000667	....	....	
18,250	73,000	.004100	.000533	....	....	
18,500	74,000	.005200	.001100	....	....	
19,000	76,000	.007400	.002200	....	....	
19,500	78,000	.009267	.001867	....	....	
20,000	80,000	.010933	.001666	....	....	
20,500	82,000	.012667	.001734	....	....	
21,000	84,000	.014333	.001666	....	....	
21,500	86,000	.016167	.001834	....	....	
22,000	88,000	.018000	.001833	....	....	
22,500	90,000	.020000	.002000	....	....	
23,000	92,000	.022000	.002000	....	....	
23,500	94,000	.024333	.002333	....	....	
24,000	96,000	.026500	.002167	....	....	
24,500	98,000	.029167	.002667	....	....	
25,000	100,000	.031867	.002700	....	....	
25,500	102,000	.035333	.003466	....	....	
26,000	104,000	.038833	.003500	....	....	
26,500	106,000	.0433	.004467	....	....	
27,000	108,000	.0467	.0034	....	....	
27,500	110,000	.0533	.0066	....	....	
28,000	112,000	.0667	.0134	....	....	
28,500	114,000	.0933	.0266	....	....	
28,540	114,160	.1033	.0100	....	....	Tensile strength.

General summary.

Specific gravity		7.8488
Hardness		24.26
Tensile strength per square inch of original section	pounds	114,160
Elastic limit per square inch of original section	do	69,000
Elongation per inch after rupture	inch	0.1667
Elongation per inch under strain at elastic limit	do	.002367
Reduction in diameter at point of rupture	do	.115
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″ from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.09, ″.16, .″25*

No. 2794.

Marks, $\overset{10}{M}\ \overset{R_1}{I_4}\ \overset{C_7}{I}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001250	.000183	0.	....	
11,250	45,000	.001400	.000150	....	....	
12,500	50,000	.001567	.000167	....	....	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001650	.000050	....	....	
13,250	53,000	.001667	.000017	....	....	
13,500	54,000	.001717	.000050	....	....	
13,750	55,000	.001750	.000033	....	....	
14,000	56,000	.001783	.000033	....	....	
14,250	57,000	.001817	.000034	....	....	
14,500	58,000	.001833	.000016	....	....	
14,750	59,050	.001867	.000034	....	....	
15,000	60,000	.001917	.000050	....	....	
15,250	61,000	.001950	.000033	....	....	
15,500	62,000	.002000	.000050	....	....	
15,750	63,000	.002033	.000033	....	....	
16,000	64,000	.002067	.000034	....	....	
16,250	65,000	.002100	.000033	....	....	
16,500	66,000	.002150	.000050	....	....	
16,750	67,000	.002200	.000050	....	....	Elastic limit
17,000	68,000	.002267	.000067	....	....	
17,250	69,000	.002350	.000083	....	....	
17,500	70,000	.002500	.000150	....	....	
17,750	71,000	.002633	.000133	....	....	
18,000	72,000	.002833	.000200	....	....	
18,250	73,000	.003067	.000234	....	....	
18,500	74,000	.003433	.000366	....	....	
19,000	76,000	.004500	.001067	....	....	
19,500	78,000	.005833	.001333	....	....	
20,000	80,000	.007667	.001834	....	....	
20,500	82,000	.008583	.000916	....	....	
21,000	84,000	.010833	.002250	....	....	
21,500	86,000	.012500	.001667	....	....	
22,000	88,000	.014000	.001500	....	....	
22,500	90,000	.015667	.001667	....	....	
23,000	92,000	.017333	.001666	....	....	
23,500	94,000	.019000	.001667	....	....	
24,000	96,000	.021000	.002000	....	....	
24,500	98,000	.023000	.002000	....	....	
25,000	100,000	.025000	.002000	....	....	
25,500	102,000	.027333	.002333	....	....	
26,000	104,000	.0300	.002667	....	....	
26,500	106,000	.0333	.0033	....	....	
27,000	108,000	.0367	.0034	....	....	
27,500	110,000	.0417	.0050	....	....	
28,000	112,000	.0450	.0033	....	....	
28,500	114,000	.0500	.0050	....	....	
29,000	116,000	.0583	.0083	....	....	
29,500	128,000	.0683	.0100	....	....	
29,820	119,280	.0850	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 119,280
Elastic limit per square inch of original section....................do ... 67,000
Elongation per inch after rupture....................inch.. 0.0867
Elongation per inch under strain at elastic limit....................do.... .002200
Reduction in diameter at point of rupture....................do.... .074
Reduction in area after rupture, per centum of original section.................... 24.6
Position of rupture....................''.7 from neck
Character of broken surface....................granular; silky center
Elongation of inch sections....................''.20*, ''.09, ''.07, ''.06, ''.07, ''.09

No. 2795.

Marks, $\substack{10\ R_1\ C_7 \\ M\ T_5\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000283	.000150	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001133	.000183	0.	....	
10,000	40,000	.001300	.000167	.000017	.000017	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001850	.000050	....	....	
14,250	57,000	.001867	.000017	....	....	
14,500	58,000	.001900	.000033	....	....	
14,750	59,000	.001933	.000033	....	....	
15,000	60,000	.001967	.000034	....	....	
15,250	61,000	.002000	.000033	....	....	
15,500	62,000	.002033	.000033	....	....	
15,750	63,000	.002067	.000034	....	....	
16,000	64,000	.002117	.000050	....	....	
16,250	65,000	.002150	.000033	....	....	
16,500	66,000	.002200	.000050	....	....	
16,750	67,000	.002233	.000033	....	....	
17,000	68,000	.002283	.000050	....	....	
17,250	69,000	.002333	.000050	....	....	Elastic limit.
17,500	70,000	.002417	.000084	....	....	
17,750	71,000	.002517	.000100	....	....	
18,000	72,000	.002750	.000233	....	....	
18,250	73,000	.003033	.000283	....	....	
18,500	74,000	.003567	.000534	....	....	
19,000	76,000	.005667	.002100	....	....	
19,500	78,000	.007333	.001666	....	....	
20,000	80,000	.008500	.001167	....	....	
20,500	82,000	.010333	.001833	....	....	
21,000	84,000	.011833	.001500	....	....	
21,500	86,000	.013500	.001667	....	....	
22,000	88,000	.015167	.001667	....	....	
22,500	90,000	.016833	.001666	....	....	
23,000	92,000	.018667	.001834	....	....	
23,500	94,000	.020500	.001833	....	....	
24,000	96,000	.022500	.002000	....	....	
24,500	98,000	.024667	.002167	....	....	
25,000	100,000	.026833	.002166	....	....	
25,500	102,000	.0300	.003167	....	....	
26,000	104,000	.0333	.0033	....	....	
26,500	106,000	.0367	.0034	....	....	
27,000	108,000	.0400	.0033	....	....	
27,500	110,000	.0450	.0050	....	....	
28,000	112,000	.0500	.0050	....	....	
28,500	114,000	.0567	.0067	....	....	
29,000	116,000	.0667	.0100	....	....	
29,480	117,920	.1033	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 117,920
Elastic limit per square inch of original section .... do.... 69,000
Elongation per inch after rupture .... inch.. 0.1850
Elongation per inch under strain at elastic limit .... do.... .002333
Reduction in diameter at point of rupture .... do.... .044
Reduction in area after rupture, per centum of original section 15.0
Position of rupture .... 2″ from neck
Character of broken surface .... granular, radiating from a dull spot at circumference
Elongation of inch sections .... ″.10, ″.17*, ″.15, ″.14, ″.15, ″.10

No. 2796.

Marks, $\genfrac{}{}{0pt}{}{10\ R\ C}{M\ T\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000470	.000150	0.		
5,000	20,000	.000633	.000163	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001117	.000150	0.		
10,000	40,000	.001283	.000166	0.		
11,250	45,000	.001450	.000167			
12,500	50,000	.001650	.000200			
12,750	51,000	.001667	.000017			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001767	.000034			
13,750	55,000	.001783	.000016			
14,000	56,000	.001833	.000050			
14,250	57,000	.001850	.000017			
14,500	58,000	.001883	.000033			
14,750	59,000	.001933	.000050			
15,000	60,000	.001967	.000034			
15,250	61,000	.002000	.000033			
15,500	62,000	.002033	.000033			
15,750	63,000	.002067	.000034			
16,000	64,000	.002100	.000033			
16,250	65,000	.002133	.000033			
16,500	66,000	.002183	.000050			
16,750	67,000	.002217	.000034			
17,000	68,000	.002267	.000050			
17,250	69,000	.002317	.000050			Elastic limit.
17,500	70,000	.002400	.000083			
17,750	71,000	.002500	.000100			
18,000	72,000	.002650	.000150			
18,250	73,000	.002850	.000200			
18,500	74,000	.003333	.000483			
19,000	76,000	.004833	.001500			
19,500	78,000	.006333	.001500			
20,000	80,000	.007833	.001500			
20,500	82,000	.009333	.001500			
21,000	84,000	.011000	.001667			
21,500	86,000	.012500	.001500			
22,000	88,000	.014167	.001667			
22,500	90,000	.015833	.001666			
23,000	92,000	.017500	.001667			
23,500	94,000	.019333	.001833			
24,000	96,000	.021000	.001667			
24,500	98,000	.023167	.002167			
25,000	100,000	.025500	.002333			
25,500	102,000	.027500	.002000			
26,000	104,000	.030167	.002667			
26,500	106,000	.0333	.003133			
27,000	108,000	.0367	.0034			
27,500	110,000	.0417	.0050			
28,000	112,000	.0450	.0033			
28,500	114,000	.0500	.0050			
29,000	116,000	.0583	.0083			
29,500	118,000	.0700	.0117			
29,870	119,480	.1017	.0317			Tensile strength.

General summary.

Specific gravity		7.8637
Hardness		28.33
Tensile strength per square inch of original section	pounds	119,480
Elastic limit per square inch of original section	do	69,000
Elongation per inch after rupture	inch	0.1183
Elongation per inch under strain at elastic limit	do	.002317
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		1″.50 from neck
Character of broken surface		granular, radiating from a dull spot at circumference
Elongation of inch sections		″.10, ″.08, ″.08, ″.20, ″.24*, ″.11

No. 2953.

Marks, $\substack{10\ B_1\ C_7\\ M\ T_7\ 1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000967	.000184	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
13,750	55,000	.001817	.000184	....	....	
15,000	60,000	.002000	.000183	....	....	
15,250	61,000	.002033	.000033	....	....	
15,500	62,000	.002067	.000034	....	....	
15,750	63,000	.002100	.000033	....	....	
16,000	64,000	.002133	.000033	....	....	
16,250	65,000	.002167	.000034	....	....	
16,500	66,000	.002217	.000050	....	....	
16,750	67,000	.002267	.000050	....	....	
17,000	68,000	.002300	.000033	....	....	
17,250	69,000	.002333	.000033	....	....	
17,500	70,000	.002367	.000034	....	....	
17,750	71,000	.002400	.000033	....	....	
18,000	72,000	.002433	.000033	....	....	Elastic limit.
18,250	73,000	.002667	.000234	....	....	
18,500	74,000	.002750	.000083	....	....	
18,750	75,000	.002800	.000050	....	....	
19,000	76,000	.002867	.000067	....	....	
19,250	77,000	.003167	.000300	....	....	
19,500	78,000	.003667	.000500	....	....	
19,750	79,000	.004167	.000500	....	....	
20,000	80,000	.005417	.001250	....	....	
20,500	82,000	.007367	.001950	....	....	
21,000	84,000	.009500	.002133	....	....	
21,500	86,000	.011583	.002083	....	....	
22,000	88,000	.013450	.001867	....	....	
22,500	90,000	.015283	.001833	....	....	
23,000	92,000	.017283	.002000	....	....	
23,500	94,000	.019417	.002134	....	....	
24,000	96,000	.021333	.001916	....	....	
24,500	98,000	.0233	.001967	....	....	
25,000	100,000	.0267	.0034	....	....	
25,500	102,000	.0300	.0033	....	....	
26,000	104,000	.0333	.0033	....	....	
26,500	106,000	.0367	.0034	....	....	
27,000	108,000	.0400	.0033	....	....	
27,500	110,000	.0450	.0050	....	....	
28,000	112,000	.0517	.0067	....	....	
28,500	114,000	.0600	.0083	....	....	
29,000	116,000	.0767	.0167	....	....	
29,160	116,640	.0933	.0166	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	116,640
Elastic limit per square inch of original section	do ...	72,000
Elongation per inch after rupture	inch..	0.1350
Elongation per inch under strain at elastic limit	do....	.002433
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″ from neck
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		″.12, ″.11, ″.08, ″.08, ″.13, ″.29*

No. 2954.

Marks, $^{10\ R_1\ C_7}_{M\ T_3\ M}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	0.	....	
10,000	40,000	.001333	.000133	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
13,750	55,000	.001833	.000166	....	....	
15,000	60,000	.002033	.000200	....	....	
15,250	61,000	.002067	.000034	....	....	
15,500	62,000	.002100	.000033	....	....	
15,750	63,000	.002100	0.	....	....	
16,000	64,000	.002167	.000067	....	....	
16,250	65,000	.002233	.000066	....	....	
16,500	66,000	.002300	.000067	....	....	
16,750	67,000	.002333	.000033	....	....	
17,000	68,000	.002333	0.	....	....	
17,250	69,000	.002367	.000034	....	....	
17,500	70,000	.002400	.000033	....	....	
17,750	71,000	.002433	.000033	....	....	
18,000	72,000	.002500	.000067	....	....	
18,250	73,000	.002567	.000067	....	....	Elastic limit.
18,500	74,000	.002767	.000200	....	....	
18,750	75,000	.003033	.000266	....	....	
19,000	76,000	.003900	.000867	....	....	
19,500	78,000	.006333	.002433	....	....	
20,000	80,000	.008500	.002167	....	....	
20,500	82,000	.010667	.002167	....	....	
21,000	84,000	.012333	.001666	....	....	
21,500	86,000	.014667	.002334	....	....	
22,000	88,000	.016667	.002000	....	....	
22,500	90,000	.018667	.002000	....	....	
23,000	92,000	.020667	.002000	....	....	
23,500	94,000	.023167	.002500	....	....	
24,000	96,000	.025667	.002500	....	....	
24,500	98,000	.028000	.002333	....	....	
25,000	100,000	.031067	.003067	....	....	
25,500	102,000	.034167	.003100	....	....	
26,000	104,000	.037933	.003766	....	....	
26,500	106,000	.0433	.005367	....	....	
27,000	108,000	.0500	.0067	....	....	
27,500	110,000	.0567	.0067	....	....	
28,000	112,000	.0667	.0100	....	....	
28,410	113,640	.0967	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.................................pounds.. 113,640
Elastic limit per square inch of original section.................................do.... 73,000
Elongation per inch after rupture.................................inch.. 0.1700
Elongation per inch under strain at elastic limit.................................do.... .002567
Reduction in diameter at point of rupture.................................do.... .135
Reduction in area after rupture, per centum of original section................................. 41.9
Position of rupture.................................1″.22 from neck
Character of broken surface.................................silky; trace of granulation
Elongation of inch sections.................................″.22*, ″.20*, ″.09

No. 2955.

Marks, $\overset{10\ R_1\ C_7}{M\ T_9\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000533	.000200	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000867	.000167	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	0.	....	
10,000	40,000	.001367	.000167	0.	....	
11,250	45,000	.001533	.000166	....	....	
12,500	50,000	.001700	.000167	....	....	
13,750	55,000	.001867	.000167	....	....	
15,000	60,000	.002067	.000200	....	....	
15,250	61,000	.002100	.000033	....	....	
15,500	62,000	.002133	.000033	....	....	
15,750	63,000	.002200	.000067	....	....	
16,000	64,000	.002233	.000033	....	....	
16,250	65,000	.002300	.000067	....	....	
16,500	66,000	.002333	.000033	....	....	
16,750	67,000	.002367	.000034	....	....	Elastic limit.
17,000	68,000	.002567	.000200	....	....	
17,250	69,000	.002767	.000200	....	....	
17,500	70,000	.003333	.000566	....	....	
18,000	72,000	.004667	.001334	....	....	
18,500	74,000	.006600	.001933	....	....	
19,000	76,000	.008500	.001900	....	....	
19,500	78,000	.010333	.001833	....	....	
20,000	80,000	.012000	.001667	....	....	
20,500	82,000	.013733	.001733	....	....	
21,000	84,000	.015600	.001867	....	....	
21,500	86,000	.017367	.001767	....	....	
22,000	88,000	.019333	.001966	....	....	
22,500	90,000	.021500	.002167	....	....	
23,000	92,000	.023733	.002233	....	....	
23,500	94,000	.026333	.002600	....	....	
24,000	96,000	.029067	.002734	....	....	
24,500	98,000	.031667	.002600	....	....	
25,000	100,000	.035167	.003500	....	....	
25,500	102,000	.039000	.003833	....	....	
26,000	104,000	.043167	.004167	....	....	
26,500	106,000	.0483	.005133	....	....	
27,000	108,000	.0567	.0084	....	....	
27,500	110,000	.0667	.0100	....	....	
28,000	112,000	.0867	.0200	....	....	
28,080	112,320	.1000	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	112,320
Elastic limit per square inch of original section	do	67,000
Elongation per inch after rupture	inch	0.1667
Elongation per inch under strain at elastic limit	do	.002367
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.17 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.21*, ″.20*, ″.09

SECOND HOOP C_7.

No. 3140.

Marks, $^{10\ R,\ C_7}_{B\ T,\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial oad.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001017	.000184	.000017	.000017	
8,750	35,000	.001183	.000166	.000017	0.	
10,000	40,000	.001333	.000150	.000017	0.	
11,250	45,000	.001483	.000150	....	....	
12,500	50,000	.001700	.000217	....	....	
12,750	51,000	.001750	.000050	....	....	
13,000	52,000	.001783	.000033	....	....	
13,250	53,000	.001833	.000050	....	....	Elastic limit.
13,500	54,000	.001950	.000117	....	....	
13,750	55,000	.002100	.000150	....	....	
14,000	56,000	.002333	.000233	....	....	
14,250	57,000	.002550	.000217	....	....	
14,500	58,000	.002783	.000233	....	....	
14,750	59,000	.002950	.000167	....	....	
15,000	60,000	.003367	.000417	....	....	
15,500	62,000	.004167	.000800	....	....	
16,000	64,000	.005133	.000966	....	....	
16,500	66,000	.006417	.001284	....	....	
17,000	68,000	.007717	.001300	....	....	
17,500	70,000	.009033	.001316	....	....	
18,000	72,000	.010500	.001467	....	....	
18,500	74,000	.011917	.001417	....	....	
19,000	76,000	.013333	.001416	....	....	
19,500	78,000	.015000	.001667	....	....	
20,000	80,000	.016667	.001667	....	....	
20,500	82,000	.018333	.001666	....	....	
21,000	84,000	.020083	.001750	....	....	
21,500	86,000	.022133	.002050	....	....	
22,000	88,000	.024333	.002200	....	....	
22,500	90,000	.026417	.002084	....	....	
23,000	92,000	.028833	.002416	....	....	
23,500	94,000	.031833	.002500	....	....	
24,000	96,000	.0350	.003667	....	....	
24,500	98,000	.0367	.0017	....	....	
25,000	100,000	.0433	.0066	....	....	
25,500	102,000	.0483	.0050	....	....	
26,000	104,000	.0517	.0034	....	....	
26,500	106,000	.0617	.0100	....	....	
27,000	108,000	.0683	.0066	....	....	
27,500	110,000	.0867	.0184	....	....	
27,590	110,360	.1267	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	110,360
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1267
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		″.82 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.23*, ″.12, ″.10, ″.09, ″.10, ″.12

No. 3141.

Marks, $\substack{10\,R^1\,C_7 \\ BT_{10}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000483	.000183	0.	....	
5, 000	20, 000	.000667	.000184	0.	....	
6, 250	25, 000	.000850	.000183	0.	....	
7, 500	30, 000	.001033	.000183	.000017	.000017	
8, 750	35, 000	.001200	.000167	.000017	0.	
10, 000	40, 000	.001350	.000150	.090017	0.	
11, 250	45, 000	.001533	.000183	....	....	
12, 500	50, 000	.001717	.000184	....	....	
12, 750	51, 000	.001783	.000066	....	....	
13, 000	52, 000	.001850	.000067	....	....	
13, 250	53, 000	.001917	.000067	....	....	Elastic limit.
13, 500	54, 000	.002067	.000150	....	....	
13, 750	55, 000	.002200	.000133	....	....	
14, 000	56, 000	.002367	.000167	....	....	
14, 250	57, 000	.002500	.000133	....	....	
14, 500	58, 000	.002717	.000217	....	....	
14, 750	59, 000	.002883	.000166	....	....	
15. 000	60 000	.003233	.000350	....	....	
15, 500	62, 000	.004000	.000767	....	....	
16, 000	64, 000	.004900	.000900	....	....	
16, 500	66, 000	.006133	.001233	....	....	
17, 000	68, 000	.007500	.001367	....	....	
17, 500	70, 000	.008833	.001333	....	....	
18, 000	72, 000	.010250	.001417	....	....	
18, 500	74, 000	.011667	.001417	....	....	
19, 000	76, 000	.013083	.001416	....	....	
19 500	78, 000	.014750	.001667	....	....	
20, 000	80, 000	.016367	.001617	....	....	
20, 500	82, 000	.018000	.001633	....	....	
21, 000	84, 000	.019833	.001833	....	....	
21, 500	86, 000	.021783	.001950	....	....	
22, 000	88, 000	.023917	.002134	....	....	
22, 500	90, 000	.026000	.002083	....	....	
23, 000	92, 000	.028750	.002750	....	....	
23, 500	94, 000	.031333	.002583	....	....	
24, 000	96, 000	.034000	.002667	....	....	
24, 500	98, 000	.0383	.0043	....	....	
25, 000	100, 000	.0433	.0050	....	....	
25, 500	102, 000	.0483	.0050	....	....	
26, 000	104, 000	.0517	.0034	....	....	
26, 500	106, 000	.0617	.0100	....	....	
27, 000	108, 000	.0700	.0083	....	....	
27, 500	110, 000	.0883	.0183	....	....	
27, 570	110, 280	.1033	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 110, 280
Elastic limit per square inch of original section..................................do ... 53, 000
Elongation per inch after rupture..................................inch.. 0. 1167
Elongation per inch under strain at elastic limit..................................do.... .001917
Reduction in diameter at point of rupture..................................do.... .064
Reduction in area after rupture, per centum of original section.................................. 21. 4
Position of rupture..................................at middle of stem
Character of broken surface, granular, radiating from a dull spot at the circumference. Opened surface cracks in the vicinity of rupture.
Elongation of inch sections..................................″.08, ″.12, ″.18*, ″.15, ″.09, ″.08

No. 3142.

Marks, $^{10\,\mathrm{R_1\,C_7}}_{\mathrm{B\,T_{11}\,M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000467	.000150	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
11,500	46,000	.001517	.000034	....	....	
11,750	47,000	.001550	.000033	....	....	
12,000	48,000	.001583	.000033	....	....	
12,250	49,000	.001633	.000050	....	....	
12,500	50,000	.001700	.000067	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001850	.000067	....	....	Elastic limit.
13,500	54,000	.002017	.000167	....	....	
13,750	55,000	.002183	.000166	....	....	
14,000	56,000	.002367	.000184	....	....	
14,250	57,000	.002533	.000166	....	....	
14,500	58,000	.002733	.000200	....	....	
14,750	59,000	.002983	.000250	....	....	
15,000	60,000	.003417	.000434	....	....	
15,500	62,000	.004250	.000833	....	....	
16,000	64,000	.005250	.001000	....	....	
16,500	66,000	.006433	.001183	....	....	
17,000	68,000	.007833	.001400	....	....	
17,500	70,000	.009083	.001250	....	....	
18,000	72,000	.010500	.001417	....	....	
18,500	74,000	.012000	.001500	....	....	
19,000	76,000	.013333	.001333	....	....	
19,500	78,000	.015083	.001750	....	....	
20,000	80,000	.016667	.001484	....	....	
20,500	82,000	.018300	.001633	....	....	
21,000	84,000	.020167	.001867	....	....	
21,500	86,000	.022167	.002000	....	....	
22,000	88,000	.024333	.002166	....	....	
22,500	90,000	.026417	.002084	....	....	
23,000	92,000	.028833	.002416	....	....	
23,500	94,000	.031250	.002417	....	....	
24,000	96,000	.034167	.002917	....	....	
24,500	98,000	.037500	.003333	....	....	
25,000	100,000	.040800	.003300	....	....	
25,500	102,000	.0467	.0059	....	....	
26,000	104,000	.0533	.0066	....	....	
26,500	106,000	.0583	.0050	....	....	
27,000	108,000	.0667	.0084	....	....	
27,500	110,000	.0867	.0200	....	....	
27,570	110,280	.0967	.0100	....	....	Tensile strength.

General summary.

Specific gravity		7.8496
Hardness		24.26
Tensile strength per square inch of original section	pounds	110,280
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.1100
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		2″.15 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.19*, ″.13, ″.09, ″.08, ″.09

No. 3143.

Marks, $\substack{10\ R,\ C_7 \\ M\ T_{10}\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000183	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000850	.000183	0.	....	
7,500	30,000	.001067	.000217	.000017	.000017	
8,750	35,000	.001233	.000166	.000017	0.	
10,000	40,000	.001383	.000150	.000017	0.	
11,250	45,000	.001567	.000184	....	....	
11,500	46,000	.001617	.000050	....	....	
11,750	47,000	.001650	.000033	....	....	Elastic limit.
12,000	48,000	.001750	.000100	....	....	
12,250	49,000	.001817	.000067	....	....	
12,500	50,000	.001883	.000066	....	....	
12,750	51,000	.001950	.000067	....	....	
13,000	52,000	.002167	.000217	....	....	
13,250	53,000	.002333	.000166	....	....	
13,500	54,000	.002517	.000184	....	....	
13,750	55,000	.002700	.000183	....	....	
14,000	56,000	.003017	.000317	....	....	
14,250	57,000	.003333	.000316	....	....	
14,500	58,000	.003850	.000517	....	....	
14,750	59,000	.004183	.000333	....	....	
15,000	60,000	.004667	.000484	....	....	
15,500	62,000	.005833	.001166	....	....	
16,000	64,000	.006950	.001117	....	....	
16,500	66,000	.008417	.001467	....	....	
17,000	68,000	.009733	.001316	....	....	
17,500	70,000	.011200	.001467	....	....	
18,000	72,000	.012583	.001383	....	....	
18,500	74,000	.014133	.001550	....	....	
19,000	76,000	.015833	.001700	....	....	
19,500	78,000	.017500	.001667	....	....	
20,000	80,000	.019083	.001583	....	....	
20,500	82,000	.021167	.002084	....	....	
21,000	84,000	.023167	.002000	....	....	
21,500	86,000	.025117	.001950	....	....	
22,000	88,000	.027500	.002383	....	....	
22,500	90,000	.029917	.002417	....	....	
23,000	92,000	.032667	.002750	....	....	
23,500	94,000	.035667	.003000	....	....	
24,000	96,000	.039000	.003333	....	....	
24,500	98,000	.0450	.0060	....	....	
25,000	100,000	.0500	.0060	....	....	
25,500	102,000	.0550	.0050	....	....	
26,000	104,000	.0633	.0083	....	....	
26,500	106,000	.0750	.0117	....	....	
26,680	106,720	.0883	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 106,720
Elastic limit per square inch of original section....................do.... 47,000
Elongation per inch after rupture....................inch.. 0.0''17
Elongation per inch under strain at elastic limit....................do.... .001650
Reduction in diameter at point of rupture....................do.... .074
Reduction in area after rupture, per centum of original section.................... 24.5
Position of rupture....................″.50 from neck
Character of broken surface....................granular; silky center
Elongation of inch sections....................″.22*, ″.08, ″.06, ″.06, ″.06, ″.07

No. 3144.

Marks, $\begin{smallmatrix}10 & R_1 & C_7 \\ M & T_{11} & O\end{smallmatrix}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000650	.000200	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
11,500	46,000	.001517	.000034	....	....	
11,750	47,000	.001550	.000033	....	....	
12,000	48,000	.001600	.000050	....	....	Elastic limit.
12,250	49,000	.001667	.000067	....	....	
12,500	50,000	.001800	.000133	....	....	
12,750	51,000	.001950	.000150	....	....	
13,000	52,000	.002167	.000217	....	....	
13,250	53,000	.002350	.000183	....	....	
13,500	54,000	.002667	.000317	....	....	
13,750	55,000	.002917	.000250	....	....	
14,000	56,000	.003333	.000416	....	....	
14,250	57,000	.003700	.000367	....	....	
14,500	58,000	.004183	.000483	....	....	
14,750	59,000	.004667	,000484	....	....	
15,000	60,000	.005250	.000583	....	....	
15,500	62,000	.006500	.001250	....	....	
16,000	64,000	.007833	.001333	....	....	
16,500	66,000	.009167	.001334	....	....	
17,000	68,000	.010667	.001500	....	....	
17,500	70,000	.012033	.001366	....	....	
18,000	72,000	.013533	.001500	....	....	
18,500	74,000	.015200	.001667	....	....	
19,000	76,000	.016867	.001667	....	....	
19,500	78,000	.018583	.001716	....	....	
20,000	80,000	.020417	.001834	....	....	
20,500	82,000	.022500	.002083	....	....	
21,000	84,000	.024667	.002167	....	....	
21,500	86,000	.027333	.002666	....	....	
22,000	88,000	.029417	.002084	....	....	
22,500	90,000	.032083	.002666	....	....	
23,000	92,000	.035000	.002917	....	....	
23,500	94,000	.038750	.003750	....	....	
24,000	96,000	.042333	.003583	....	....	
24,500	98,000	.0483	.005967	....	....	
25,000	100,000	.0533	.0050	....	....	
25,500	102,000	.0633	.0100	....	....	
26,000	104,000	.0700	.0067	....	....	
26,420	105,680	.0967	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105,680
Elastic limit per square inch of original section	do ...	48,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.[illegible]
Reduction in area after rupture, per centum of original section		3[illegible].6
Position of rupture		3".50 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".05, ".07, ".10, ."27", ".15, ".08

No. 3145.

Marks, $\substack{10\ R_1\ C_7 \\ M\ T_{13}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000163	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000683	.000183	0.	....	
6,250	25,000	.000867	.000184	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001233	.000200	.000068	.000038	
10,000	40,000	.001450	.000217	.000050	.000017	
11,250	45,000	.001650	.000200	....	....	Elastic limit.
11,500	46,000	.001767	.000117	....	....	
11,750	47,000	.001867	.000100	....	....	
12,000	48,000	.002033	.000166	....	....	
12,250	49,000	.002250	.000217	....	....	
12,500	50,000	.002667	.000417	....	....	
12,750	51,000	.003033	.000366	....	....	
13,000	52,000	.003583	.000550	....	....	
13,250	53,000	.004083	.000500	....	....	
13,500	54,000	.004667	.000584	....	....	
13,750	55,000	.005200	.000533	....	....	
14,000	56,000	.005750	.000550	....	....	
14,250	57,000	.006333	.000583	....	....	
14,500	58,000	.006933	.000600	....	....	
14,750	59,000	.007500	.000567	....	....	
15,000	60,000	.008267	.000767	....	....	
15,500	62,000	.009733	.001466	....	....	
16,000	64,000	.011167	.001434	....	....	
16,500	66,000	.012583	.001416	....	....	
17,000	68,000	.014167	.001584	....	....	
17,500	70,000	.015917	.001750	....	....	
18,000	72,000	.017917	.002000	....	....	
18,500	74,000	.019667	.001750	....	....	
19,000	76,000	.021250	.001583	....	....	
19,500	78,000	.023333	.002083	....	....	
20,000	80,000	.025500	.002167	....	....	
20,500	82,000	.027500	.002000	....	....	
21,000	84,000	.030417	.002917	....	....	
21,500	86,000	.033333	.002916	....	....	
22,000	88,000	.036000	.002667	....	....	
22,500	90,000	.039583	.003583	....	....	
23,000	92,000	.043000	.003417	....	....	
23,500	94,000	.0483	.0053	....	....	
24,000	96,000	.0533	.0050	....	....	
24,500	98,000	.0633	.0100	....	....	
25,000	100,000	.0717	.0084	....	....	
25,500	102,000	.0917	.0200	....	....	
25,680	102,720	.1117	.0200	....	....	Tensile strength.

General summary.

Specific gravity		7.8491
Hardness		20.81
Tensile strength per square inch of original section	pounds	102,720
Elastic limit per square inch of original section	do	45,000
Elongation per inch after rupture	inch	0.1200
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		″.05 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.20*, ″.15, ″.08, ″.09, ″.10, ″.10

No. 3177.

Marks, $\begin{smallmatrix}10\ R_1\ C_7\\ B\ T_8\ M\end{smallmatrix}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001183	.000183	.000017	.000017	
10,000	40,000	.001350	.000167	.000017	0.	
11,250	45,000	.001517	.000167	....	....	
12,500	50,000	.001700	.000183	....	....	Elastic limit.
12,750	51,000	.001783	.000083	....	....	
13,000	52,000	.001867	.000084	....	....	
13,250	53,000	.001933	.000066	....	....	
13,500	54,000	.002033	.000100	....	....	
13,750	55,000	.002133	.000100	....	....	
14,000	56,000	.002283	.000150	....	....	
14,250	57,000	.002400	.000117	....	....	
14,500	58,000	.002567	.000167	....	....	
14,750	59,000	.002733	.000166	....	....	
15,000	60,000	.002950	.000217	....	....	
15,500	62,000	.003533	.000583	....	....	
16,000	64,000	.004417	.000884	....	....	
16,500	66,000	.005417	.001000	....	....	
17,000	68,000	.006583	.001166	....	....	
17,500	70,000	.007850	.001267	....	....	
18,000	72,000	.009333	.001483	....	....	
18,500	74,000	.010667	.001334	....	....	
19,000	76,000	.012167	.001500	....	....	
19,500	78,000	.013750	.001583	....	....	
20,000	80,000	.015417	.001667	....	....	
20,500	82,000	.016750	.001333	....	....	
21,000	84,000	.018583	.001833	....	....	
21,500	86,000	.020500	.001917	....	....	
22,000	88,000	.022500	.002000	....	....	
22,500	90,000	.024583	.002083	....	....	
23,000	92,000	.026783	.002200	....	....	
23,500	94,000	.029167	.002384	....	....	
24,000	96,000	.0317	.002533	....	....	
24,500	98,000	.0342	.0025	....	....	
25,000	100,000	.0367	.0025	....	....	
25,500	102,000	.0433	.0066	....	....	
26,000	104,000	.0483	.0050	....	....	
26,500	106,000	.0517	.0034	....	....	
27,000	108,000	.0617	.0100	....	....	
27,500	110,000	.0733	.0116	....	....	
27,690	110,760	.0867	.0134	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................pounds.. 110,760
Elastic limit per square inch of original section..................do.... 50,000
Elongation per inch after rupture..................inch.. 0.1600
Elongation per inch under strain at elastic limit..................do.... .001700
Reduction in diameter at point of rupture..................do.... .064
Reduction in area after rupture, per centum of original section.................. 21.4
Position of rupture..................2".75 from neck
Character of broken surface..................granular; silky spot at circumference
Elongation of inch sections..................".05, ".06, ".23*, ".10, ".09, ".05

No. 3178.

Marks, $\genfrac{}{}{0pt}{}{10\ R_1\ C_7}{M\ T_{12}\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001183	.000183	0.	....	
10,000	40,000	.001350	.000167	0.	....	
11,250	45,000	.001500	.000150	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001717	.000050	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001783	.000016	....	....	
13,500	54,000	.001817	.000034	....	....	
13,750	55,000	.001867	.000050	....	....	Elastic limit.
14,000	56,000	.001933	.000066	....	....	
14,250	57,000	.002000	.000067	....	....	
14,500	58,000	.002050	.000050	....	....	
14,750	59,000	.002100	.000050	....	....	
15,000	60,000	.002150	.000050	....	....	
15,250	61,000	.002200	.000050	....	....	
15,500	62,000	.002267	.000067	....	....	
15,750	63,000	.002367	.000100	....	....	
16,000	64,000	.002467	.000100	....	....	
16,500	66,000	.002667	.000200	....	....	
17,000	68,000	.003000	.000333	....	....	
17,500	70,000	.003500	.000500	....	....	
18,000	72,000	.004067	.000567	....	....	
18,500	74,000	.004967	.000900	....	....	
19,000	76,000	.005917	.000950	....	....	
19,500	78,000	.007033	.001116	....	....	
20,000	80,000	.008367	.001334	....	....	
20,500	82,000	.009750	.001383	....	....	
21,000	84,000	.011250	.001500	....	....	
21,500	86,000	.012733	.001483	....	....	
22,000	88,000	.014233	.001500	....	....	
22,500	90,000	.015917	.001684	....	....	
23,000	92,000	.017667	.001750	....	....	
23,500	94,000	.019500	.001833	....	....	
24,000	96,000	.021133	.001633	....	....	
24,500	98,000	.0233	.002167	....	....	
25,000	100,000	.0267	.0034	....	....	
25,500	102,000	.0300	.0033	....	....	
26,000	104,000	.0333	.0033	....	....	
26,500	106,000	.0367	.0034	....	....	
27,000	108,000	.0383	.0016	....	....	
27,500	110,000	.0400	.0017	....	....	
28,000	112,000	.0433	.0033	....	....	
28,500	114,000	.0500	.0067	....	....	
29,000	116,000	.0550	.0050	....	....	
29,500	118,000	.0683	.0133	....	....	
29,550	118,200	.0733	.0050	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	118,200
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.0767
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		″.60 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.06, ″.05, ″.05, ″.05, ″.07, ″.18*

No. 3179.

Marks, $\begin{smallmatrix}10\ R_1\ C_7\\ M\ T_{14}\ O\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000183	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000850	.000183	0.	....	
7,500	30,000	.001050	.000200	0.	....	
8,750	35,000	.001217	.000167	0.	....	
10,000	40,000	.001383	.000166	0.	....	
11,250	45,000	.001550	.000167	....	....	
12,500	50,000	.001767	.000217	....	....	
12,750	51,000	.001800	.000033	....	....	Elastic limit.
13,000	52,000	.001917	.000117	....	....	
13,250	53,000	.002000	.000083	....	....	
13,500	54,000	.002100	.000100	....	....	
13,750	55,000	.002183	.000083	....	....	
14,000	56,000	.002333	.000150	....	....	
14,250	57,000	.002467	.000134	....	....	
14,500	58,000	.002600	.000133	....	....	
14,750	59,000	.002733	.000133	....	....	
15,000	60,000	.002917	.000184	....	....	
15,500	62,000	.003533	.000616	....	....	
16,000	64,000	.004333	.000800	....	....	
16,500	66,000	.005417	.001084	....	....	
17,000	68,000	.006367	.000950	....	....	
17,500	70,000	.007633	.001266	....	....	
18,000	72,000	.009000	.001367	....	....	
18,500	74,000	.010250	.001250	....	....	
19,000	76,000	.011750	.001500	....	....	
19,500	78,000	.013333	.001583	....	....	
20,000	80,000	.014833	.001500	....	....	
20,500	82,000	.016500	.001667	....	....	
21,000	84,000	.018250	.001750	....	....	
21,500	86,000	.020083	.001833	....	....	
22,000	88,000	.022833	.002750	....	....	
22,500	90,000	.023917	.001084	....	....	
23,000	92,000	.0267	.002783	....	....	
23,500	94,000	.0300	.0033	....	....	
24,000	96,000	.0333	.0033	....	....	
24,500	98,000	.0350	.0017	....	....	
25,000	100,000	.0383	.0033	....	....	
25,500	102,000	.0417	.0034	....	....	
26,000	104,000	.0467	.0050	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0600	.0083	....	....	
27,500	110,000	.0683	.0083	....	....	
28,000	112,000	.0867	.0184	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	112,000
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1100
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1″.79 from neck
Character of broken surface		granular; silky eccentric spot
Elongation of inch sections		″.06, ″ 07, ″.08, ″.10, ″.24*, ″.11

No. 3180.

Marks, $\overset{10\ R_1\ C_7}{M\ T_{15}\ M}$
Diameter, ″.564.
Sectional are, .24 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001683	.000200	....	....	
12,750	51,000	.001717	.000034	....	....	Elastic limit.
13,000	52,000	.001783	.000066	....	....	
13,250	53,000	.001850	.000067	....	....	
13,500	54,000	.001917	.000067	....	....	
13,750	55,000	.001983	.000066	....	....	
14,000	56,000	.002067	.000084	....	....	
14,250	57,000	.002167	.000100	....	....	
14,500	58,000	.002267	.000100	....	....	
14,750	59,000	.002367	.000100	....	....	
15,000	60,000	.002517	.000150	....	....	
15,500	62,000	.002917	.000400	....	....	
16,000	64,000	.003450	.000533	....	....	
16,500	66,000	.004250	.000800	....	....	
17,000	68,000	.005333	.001083	....	....	
17,500	70,000	.006517	.001184	....	....	
18,000	72,000	.007667	.001150	....	....	
18,500	74,000	.009083	.001416	....	....	
19,000	76,000	.010583	.001500	....	....	
19,500	78,000	.012000	.001417	....	....	
20,000	80,000	.013500	.001500	....	....	
20,500	82,000	.015083	.001583	....	....	
21,000	84,000	.016667	.001584	....	....	
21,500	86,000	.018333	.001666	....	....	
22,000	88,000	.020417	.002084	....	....	
22,500	90,000	.022333	.001916	....	....	
23,000	92,000	.024167	.001834	....	....	
23,500	94,000	.026417	.002250	....	....	
24,000	96,000	.028417	.002000	....	....	
24,500	98,000	.0317	.003283	....	....	
25,000	100,000	.0350	.0033	....	....	
25,500	102,000	.0375	.0025	....	....	
26,000	104,000	.0417	.0042	....	....	
26,500	106,000	.0467	.0050	....	....	
27,000	108,000	.0517	.0050	....	....	
27,500	110,000	.0600	.0083	....	....	
28,000	112,000	.0700	.0100	....	....	
28,480	113,920	.1033	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	113,920
Elastic limit per square inch of original section .... do....	51,000
Elongation per inch after rupture .... inch..	0.1200
Elongation per inch under strain at elastic limit .... do....	.001717
Reduction in diameter at point of rupture .... do....	.074
Reduction in area after rupture, per centum of original section	24.6
Position of rupture	1″.20 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	″.11, ″11, ″.09, ″.09, ″.18*, ″.14

THIRD HOOP C_7.

No. 3371.

Marks, $^{10\ R_1\ C_7}_{B\ T_{13}\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001667	.000184	....	....	Elastic limit.
12,750	51,000	.001767	.000100	....	....	
13,000	52,000	.002067	.000300	....	....	
13,250	53,000	.002767	.000700	....	....	
13,500	54,000	.003833	.001066	....	....	
13,750	55,000	.004833	.001000	....	....	
14,000	56,000	.006167	.001334	....	....	
14,250	57,000	.006700	.000533	....	....	
14,500	58,000	.007367	.000667	....	....	
14,750	59,000	.008000	.000633	....	....	
15,000	60,000	.008867	.000867	....	....	
15,500	62,000	.010350	.001483	....	....	
16,000	64,000	.012250	.001900	....	....	
16,500	66,000	.014333	.002083	....	....	
17,000	68,000	.016000	.001667	....	....	
17,500	70,000	.017167	.001167	....	....	
18,000	72,000	.018917	.001750	....	....	
18,500	74,000	.021167	.002250	....	....	
19,000	76,000	.023167	.002000	....	....	
19,500	78,000	.024667	.001500	....	....	
20,000	80,000	.027000	.002333	....	....	
20,500	82,000	.0300	.0030	....	....	
21,000	84,000	.0333	.0033	....	....	
21,500	86,000	.0367	.0034	....	....	
22,000	88,000	.0400	.0033	....	....	
22,500	90,000	.0450	.0050	....	....	
23,000	92,000	.0500	.0050	....	....	
23,500	94,000	.0567	.0067	....	....	
24,000	96,000	.0633	.0066	....	....	
24,500	98,000	.0767	.0134	....	....	
25,000	100,000	.1117	.0350	....	....	
25,030	100,120	.1300	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,120
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		1".95 from neck
Character of broken surface		granular; dull spot at the circumference
Elongation of inch sections		".09, ".12, ".16, ".15, ".21*, ".19

No. 3372.

Marks, $\begin{matrix}10\ R_1\ C_7\\ B\ T_{14}\ O\end{matrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000633	.000150	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	Elastic limit.
13,500	54,000	.001817	.000084	....	....	
13,750	55,000	.002000	.000183	....	....	
14,000	56,000	.002533	.000533	....	....	
14,250	57,000	.003033	.000500	....	....	
14,500	58,000	.003650	.000617	....	....	
14,750	59,000	.004383	.000733	....	....	
15,000	60,000	.005117	.000734	....	....	
15,500	62,000	.006533	.001416	....	....	
16,000	64,000	.008000	.001467	....	....	
16,500	66,000	.009333	.001333	....	....	
17,000	68,000	.010667	.001334	....	....	
17,500	70,000	.012017	.001350	....	....	
18,000	72,000	.013500	.001483	....	....	
18,500	74,000	.015000	.001500	....	....	
19,000	76,000	.016583	.001583	....	....	
19,500	78,000	.018267	.001684	....	....	
20,000	80,000	.019917	.001650	....	....	
20,500	82,000	.021833	.001916	....	....	
21,000	84,000	.023833	.002000	....	....	
21,500	86,000	.025917	.002084	....	....	
22,000	88,000	.028333	.002416	....	....	
22,500	90,000	.030667	.002334	....	....	
23,000	92,000	.0333	.002633	....	....	
23,500	94,000	.0367	.0034	....	....	
24,000	96,000	.0400	.0033	....	....	
24,500	98,000	.0467	.0067	....	....	
25,000	100,000	.0517	.0050	....	....	
25,500	102,000	.0600	.0083	....	....	
26,000	104,000	.0700	.0100	....	....	
26,480	105,920	.1050	.0350	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105,920
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.001733
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.07, ″.12, ″.33*, ″.12, ″.09. ″.07

No. 3373.

Marks, $\substack{10\ R_1\ C_7 \\ B\ T_{15}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000317	.000184	0.	....	
3, 750	15, 000	.000467	.000150	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001683	.000050	....	....	Elastic limit.
13, 000	52, 000	.002283	.000600	....	....	
13, 250	53, 000	.003000	.000717	....	....	
13, 500	54, 000	.003833	.000833	....	....	
13, 750	55, 000	.004367	.000534	....	....	
14, 000	56, 000	.005183	.000816	....	....	
14, 250	57, 000	.005967	.000784	....	....	
14, 500	58, 000	.006667	.000700	....	....	
14, 750	59, 000	.007250	.000583	....	....	
15, 000	60, 000	.008000	.000750	....	....	
15, 500	62, 000	.009200	.001200	....	....	
16, 000	64, 000	.010583	.001383	....	....	
16, 500	66, 000	.011917	.001334	....	....	
17, 000	68, 000	.013417	.001500	....	....	
17, 500	70, 000	.015000	.001583	....	....	
18, 000	72, 000	.016500	.001500	....	....	
18, 500	74, 000	.018250	.001750	....	....	
19, 000	76, 000	.002000	.001750	....	....	
19, 500	78, 000	.021833	.001833	....	....	
20, 000	80, 000	.033833	.002000	....	....	
20, 500	82, 000	.026083	.002250	....	....	
21, 000	84, 000	.028667	.002584	....	....	
21, 500	86, 000	.031000	.002333	....	....	
22, 000	88, 000	.034917	.002917	....	....	
22, 500	90, 000	.036867	.002950	....	....	
23, 000	92, 000	.0417	.004833	....	....	
23, 500	94, 000	.0467	.0050	....	....	
24, 000	96, 000	.0517	.0050	....	....	
24, 500	98, 000	.0583	.0066	....	....	
25, 000	100, 000	.0700	.0117	....	....	
25, 500	102, 000	.0950	.0250	....	....	
25, 560	102, 240	.1067	.0117	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102, 240
Elastic limit per square inch of original section	do....	51, 000
Elongation per inch after rupture	inch..	0. 1300
Elongation per inch under strain at elastic limit	do....	.001683
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		3″.25 from neck
Character of broken surface		granular; radiating from dull spot at circumference
Elongation of inch sections		″.07, ″.11, ″.18, ″.24*, ″.11, ″.07

No. 3374.

Marks, $\begin{matrix}10\ R_1\ C_7\\ M\ T_{16}\ I\end{matrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000300	.000183	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001300	.000167	0.		
11,250	45,000	.001467	.000167			
12,500	50,000	.001650	.000183			
12,750	51,000	.001683	.000033			
13,000	52,000	.001700	.000017			
13,250	53,000	.001750	.000050			
13,500	54,000	.001800	.000050			
13,750	55,000	.001833	.000033			Elastic limit.
14,000	56,000	.001900	.000067			
14,250	57,000	.002000	.000100			
14,500	58,000	.002150	.000150			
14,750	59,000	.002367	.000217			
15,000	60,000	.002800	.000433			
15,500	62,000	.005167	.002367			
16,000	64,000	.007000	.001833			
16,500	66,000	.008000	.001000			
17,000	68,000	.009133	.001133			
17,500	70,000	.010500	.001367			
18,000	72,000	.011800	.001300			
18,500	74,000	.013167	.001367			
19,000	76,000	.015167	.002000			
19,500	78,000	.016333	.001166			
20,000	80,000	.018083	.001750			
20,500	82,000	.019667	.001584			
21,000	84,000	.021167	.001500			
21,500	86,000	.023000	.001833			
22,000	88,000	.024917	.001917			
22,500	90,000	.027167	.002250			
23,000	92,000	.029500	.002333			
23,500	94,000	.032333	.002833			
24,000	96,000	.0350	.002667			
24,500	98,000	.0383	.0033			
25,000	100,000	.0450	.0067			
25,500	102,000	.0500	.0050			
26,000	104,000	.0517	.0017			
26,500	106,000	.0617	.0100			
27,000	108,000	.0733	.0116			
27,480	109,920	.1133	.0400			Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds . 109,920
Elastic limit per square inch of original section....................do.... 55,000
Elongation per inch after rupture....................inch.. 0.1633
Elongation per inch under strain at elastic limit....................do .... .001833
Reduction in diameter at point of rupture....................do.... .144
Reduction in area after rupture, per centum of original section.................... 44.6
Position of rupture....................2″.65 from neck
Character of broken surface....................silky
Elongation of inch sections....................″.09, ″.15, ″.35*, ″.13, ″.13, ″.13

No. 3144.

Marks, $\overset{10}{M}\ \overset{E_1}{T_{11}}\ \overset{C_7}{O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000300	.000183	0.	....	
3, 750	15, 000	.000450	.000150	0.	....	
5, 000	20, 000	.000650	.000200	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.000983	.000166	0.	....	
8, 750	35, 000	.001150	.000167	0.	....	
10, 000	40, 000	.001317	.000167	0.	....	
11, 250	45, 000	.001483	.000166	....	....	
11, 500	46, 000	.001517	.000034	....	....	
11, 750	47, 000	.001550	.000033	....	....	
12, 000	48, 000	.001600	.000050	....	....	Elastic limit.
12, 250	49, 000	.001667	.000067	....	....	
12, 500	50, 000	.001800	.000133	....	....	
12, 750	51, 000	.001950	.000150	....	....	
13, 000	52, 000	.002167	.000217	....	....	
13, 250	53, 000	.002350	.000183	....	....	
13, 500	54, 000	.002667	.000317	....	....	
13, 750	55, 000	.002917	.000250	....	....	
14, 000	56, 000	.003333	.000416	....	....	
14, 250	57, 000	.003700	.000367	....	....	
14, 500	58, 000	.004183	.000483	....	....	
14, 750	59, 000	.004667	,000484	....	....	
15, 000	60, 000	.005250	.000583	....	....	
15, 500	62, 000	.006500	.001250	....	....	
16, 000	64, 000	.007833	.001333	....	....	
16, 500	66, 000	.009167	.001334	....	....	
17, 000	68, 000	.010667	.001500	....	....	
17, 500	70, 000	.012033	.001366	....	....	
18, 000	72, 000	.013533	.001500	....	....	
18, 500	74, 000	.015200	.001667	....	....	
19, 000	76, 000	.016867	.001667	....	....	
19, 500	78, 000	.018583	.001716	....	....	
20, 000	80, 000	.020417	.001834	....	....	
20, 500	82, 000	.022500	.002083	....	....	
21, 000	84, 000	.024667	.002167	....	....	
21, 500	86, 000	.027333	.002666	....	....	
22, 000	88, 000	.029417	.002084	....	....	
22, 500	90, 000	.032083	.002666	....	....	
23, 600	92, 000	.035000	.002917	....	....	
23, 500	94, 000	.038750	.003750	....	....	
24, 000	96, 000	.042333	.003583	....	....	
24, 500	98, 000	.0483	.005967	....	....	
25, 000	100, 000	.0533	.0050	....	....	
25, 500	102, 000	.0633	.0100	....	....	
26, 000	104, 000	.0700	.0067	....	....	
26, 420	105, 680	.0967	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 105,680
Elastic limit per square inch of original section..............................do ... 48,000
Elongation per inch after rupture..............................inch.. 0.1250
Elongation per inch under strain at elastic limit..............................do.... .001600
Reduction in diameter at point of rupture..............................do.... .004
Reduction in area after rupture, per centum of original section.............................. 30.6
Position of rupture..............................3".50 from neck
Character of broken surface..............................granular; silky centre
Elongation of inch sections..............................".05, ".07, ".10, ".27, ".15, ".08

No. 3376.

Marks, $\begin{matrix}10\ R_1\ C_7\\ M\ T_{13}\ M\end{matrix}$
Diameter, ″.564.
Sectional area, 25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001183	.000183	0.	....	
10,000	40,000	.001367	.000184	0.	....	
11,250	45,000	.001517	.000150	....	....	
12,500	50,000	.001700	.000183	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001833	.000050	....	....	Elastic limit.
13,500	54,000	.001917	.000084	....	....	
13,750	55,000	.002000	.000083	....	....	
14,000	56,000	.002283	.000283	....	....	
14,250	57,000	.003333	.001050	....	....	
14,500	58,000	.004167	.000834	....	....	
14,750	59,000	.004850	.000683	....	....	
15,000	60,000	.005533	.000683	....	....	
15,500	62,000	.006717	.001184	....	....	
16,000	64,000	.008083	.001366	....	....	
16,500	66,000	.009600	.001517	....	....	
17,000	68,000	.010833	.001233	....	....	
17,500	70,000	.012033	.001200	....	....	
18,000	72,000	.013217	.001184	....	....	
18,500	74,000	.014667	.001450	....	....	
19,000	76,000	.016250	.001583	....	....	
19,500	78,000	.017833	.001583	....	....	
20,000	80,000	.019167	.001334	....	....	
20,500	82,000	.020917	.001750	....	....	
21,000	84,000	.022667	.001750	....	....	
21,500	86,000	.024667	.002000	....	....	
22,000	88,000	.026517	.001850	....	....	
22,500	90,000	.028833	.002316	....	....	
23,000	92,000	.031417	.002584	....	....	
23,500	94,000	.034167	.002750	....	....	
24,000	96,000	.037250	.003083	....	....	
24,500	98,000	.040833	.003583	....	....	
25,000	100,000	.044917	.004084	....	....	
25,500	102,000	.0500	.005083	....	....	
26,000	104,000	.0600	.0100	....	....	
26,500	106,000	.0667	.0067	....	....	
27,000	108,000	.0833	.0166	....	....	
27,180	108,720	.1017	.0184	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,720
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0 1233
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.60 from neck
Character of broken surface		silky, with trace of granulation
Elongation of inch sections		″.10, ″.29*, ″.10, ″.09, ″.09, ″.07

No. 3395.

Marks, $\frac{10\ \mathrm{R}_1\ \mathrm{C}_7}{\mathrm{B\ T}_{16}\ \mathrm{I}}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000317	.000184	0.		
3,750	15,000	.000483	.000166	0.		
5,000	20,000	.000633	.000150	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001300	.000167	0.		
11,250	45,000	.001467	.000167			
12,500	50,000	.001633	.000166			
12,750	51,000	.001667	.000034			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001767	.000034			
13,750	55,000	.001800	.000033			
14,000	56,000	.001833	.000033			
14,250	57,000	.001867	.000034			
14,500	58,000	.001900	.000033			
14,750	59,000	.001933	.000033			
15,000	60,000	.001983	.000050			
15,250	61,000	.002017	.000034			
15,500	62,000	.002050	.000033			
15,750	63,000	.002083	.000033			
16,000	64,000	.002117	.000034			
16,250	65,000	.002167	.000050			
16,500	66,000	.002217	.000050			Elastic limit.
16,750	67,000	.002317	.000100			
17,000	68,000	.002383	.000066			
17,250	69,000	.002533	.000150			
17,500	70,000	.002650	.000117			
17,750	71,000	.002883	.000233			
18,000	72,000	.003167	.000284			
18,500	74,000	.003683	.000516			
19,000	76,000	.004667	.000984			
19,500	78,000	.005333	.000666			
20,000	80,000	.007750	.001417			
20,500	82,000	.009667	.001917			
21,000	84,000	.011333	.001666			
21,500	86,000	.013167	.001834			
22,000	88,000	.014800	.001633			
22,500	90,000	.016333	.001533			
23,000	92,000	.018050	.001717			
23,500	94,000	.019933	.001883			
24,000	96,000	.022000	.002067			
24,500	98,000	.0233	.0013			
25,000	100,000	.0283	.0050			
25,500	102,000	.0317	.0034			
26,000	104,000	.0350	.0033			
26,500	106,000	.0375	.0025			
27,000	108,000	.0392	.0017			
27,500	110,000	.0433	.0041			
28,000	112,000	.0500	.0067			
28,500	114,000	.0550	.0050			
29,000	116,000	.0633	.0083			
29,500	118,000	.0850	.0217			
29,540	118,160	.0967	.0117			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	118,160
Elastic limit per square inch of original section	do ...	66,000
Elongation per inch after rupture	inch..	0.1167
Elongation per inch under strain at elastic limit	do....	.002217
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2".05 from neck
Character of broken surface		granular; dull spot at the circumference
Elongation of inch sections		".09, ".24, ".14, ".09, ".07, ".08

No. 3396.

Marks, $\substack{10\ R_1\ C_7 \\ B\ T_{17}\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000317	.000200	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000650	.000167	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.000983	.000166	0.	....	
8, 750	35, 000	.001133	.000150	0.	....	
10, 000	40, 000	.001317	.000184	0.	....	
11, 250	45, 000	.001483	.000166	....	....	
12, 500	50, 000	.001650	.000167	....	....	
12, 750	51, 000	.001683	.000033	....	....	
13, 000	52, 000	.001717	.000034	....	....	
13, 250	53, 000	.001750	.000033	....	....	
13, 500	54, 000	.001800	.000050	....	....	
13, 750	55, 000	.001833	.000033	....	....	
14, 000	56, 000	.001883	.000050	....	....	
14, 250	57, 000	.001900	.000017	....	....	
14, 500	58, 000	.001950	.000050	....	....	
14, 750	59, 000	.002000	.000050	....	....	Elastic limit.
15, 000	60, 000	.002083	.000083	....	....	
15, 250	61, 000	.002250	.000167	....	....	
15, 500	62, 000	.002467	.000217	....	....	
15, 750	63, 000	.002700	.000233	....	....	
16, 000	64, 000	.002967	.000267	....	....	
16, 500	66, 000	.003667	.000700	....	....	
17, 000	68, 000	.004633	.000966	....	....	
17, 500	70, 000	.005867	.001234	....	....	
18, 000	72, 000	.006950	.001083	....	....	
18, 500	74, 000	.008000	.001050	....	....	
19, 000	76, 000	.009283	.001283	....	....	
19, 500	78, 000	.010583	.001300	....	....	
20, 000	80, 000	.011917	.001334	....	....	
20, 500	82, 000	.013233	.001316	....	....	
21, 000	84, 000	.014583	.001350	....	....	
21, 500	86, 000	.016000	.001417	....	....	
22, 000	88, 000	.017633	.001633	....	....	
22, 500	90, 000	.019333	.001700	....	....	
23, 000	92, 000	.020850	.001517	....	....	
23, 500	94, 000	.022750	.001900	....	....	
24, 000	96, 000	.024667	.001917	....	....	
24, 500	98, 000	.026583	.001916	....	....	
25, 000	100, 000	.028667	.002084	....	....	
25, 500	102, 000	.0317	.003033	....	....	
26, 000	104, 000	.0358	.0041	....	....	
26, 500	106, 000	.0383	.0025	....	....	
27, 000	108, 000	.0433	.0050	....	....	
27, 500	110, 000	.0483	.0050	....	....	
28, 000	112, 000	.0517	.0034	....	....	
28, 500	114, 000	.0600	.0083	....	....	
28, 880	115, 520	0767	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	115, 520
Elastic limit per square inch of original section	do ...	59, 000
Elongation per inch after rupture	inch..	0. 0767
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15. 0
Position of rupture		2″.85 from neck
Character of broken surface		granular; dull spot at the circumference
Elongation of inch sections		″.04, ″.07, ″.12, ″.14, ″.06, ″.04

No. 3397.

Marks, $^{10\ B_1\ C_7}_{B\ T_{18}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

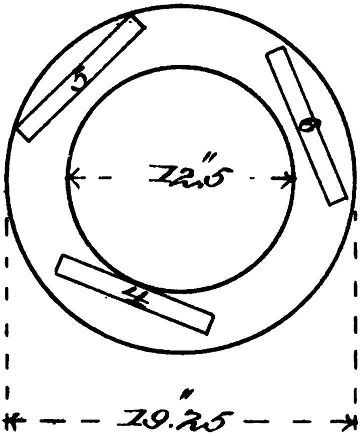
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000333	.000163	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000817	.000150	0.		
7,500	30,000	.001000	.000183	0.		
8,750	35,000	.001167	.000167	0.		
10,000	40,000	.001333	.000166	0.		
11,250	45,000	.001500	.000167			
12,500	50,000	.001667	.000167			
12,750	51,000	.001700	.000033			
13,000	52,000	.001733	.000033			
13,250	53,000	.001767	.000034			
13,500	54,000	.001783	.000016			
13,750	55,000	.001833	.000050			
14,000	56,000	.001900	.000067			
14,250	57,000	.001917	.000017			
14,500	58,000	.001950	.000033			
14,750	59,000	.002000	.000050			
15,000	60,000	.002033	.000033			
15,250	61,000	.002067	.000034			
15,500	62,000	.002117	.000050			Elastic limit.
15,750	63,000	.002183	.000066			
16,000	64,000	.002267	.000084			
16,250	65,000	.002400	.000133			
16,500	66,000	.002600	.000200			
16,750	67,000	.002767	.000167			
17,000	68,000	.002933	.000166			
17,500	70,000	.003767	.000834			
18,000	72,000	.004833	.001066			
18,500	74,000	.006167	.001334			
19,000	76,000	.007367	.001200			
19,500	78,000	.009033	.001666			
20,000	80,000	.010500	.001467			
20,500	82,000	.011717	.001217			
21,000	84,000	.013433	.001767			
21,500	86,000	.014917	.001484			
22,000	88,000	.016433	.001516			
22,500	90,000	.018117	.001684			
23,000	92,000	.019800	.001683			
23,500	94,000	.021717	.001917			
24,000	96,000	.023617	.001900			
24,500	98,000	.025833	.002216			
25,000	100,000	.028667	.002834			
25,500	102,000	.0308	.002133			
26,000	104,000	.0333	.0025			
26,500	106,000	.0358	.0025			
27,000	108,000	.0383	.0025			
27,500	110,000	.0450	.0067			
28,000	112,000	.0500	.0050			
28,500	114,000	.0567	.0067			
29,000	116,000	.0683	.0116			
29,240	116,960	.0850	.0167			Tensile strength.

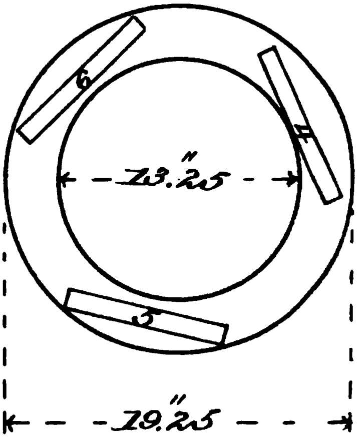
General summary.

Tensile strength per square inch of original section……pounds.. 116,960
Elastic limit per square inch of original section……do.... 62,000
Elongation per inch after rupture……inch.. 0.0850
Elongation per inch under strain at elastic limit……do.... .002117
Reduction in diameter at point of rupture……do.... .144
Reduction in area after rupture, per centum of original section…… 15.0
Position of rupture……2″.70 from neck
Character of broken surface....granular; dull spot at the circumference. Opened cracks in stem near place of rupture.
Elongation of inch sections……″.04, ″.06, ″.08, ″.14*, ″.10, ″.08

10 inch steel B. L. Rifle

Hoop C 8


Muzzle


Breech

No. 2798.

Marks, $^{10\,R_1\,C_3}_{B\,T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000250	.000150	0.	....	
3, 750	15, 000	.000417	.000167	0.	....	
5, 000	20, 000	.000583	.000166	0.	....	
6, 250	25, 000	.000783	.000150	0.	....	
7, 500	30, 000	.000917	.000184	0.	....	
8, 750	35, 000	.001083	.000166	0.	....	
10, 000	40, 000	.001250	.000167	0.	....	
11, 250	45, 000	.001417	.000166	....	....	
12, 500	50, 000	.001583	.000166	....	....	
12, 750	51, 000	.001617	.000034	....	....	
13, 000	52, 000	.001650	.000033	....	....	
13, 250	53, 000	.001683	.000033	....	....	
13, 500	54, 000	.001733	.000050	....	....	
13, 750	55, 000	.001750	.000017	....	....	
14, 000	56, 000	.001783	.000033	....	....	
14, 250	57, 000	.001817	.000034	....	....	
14, 500	58, 000	.001850	.000033	....	....	
14, 750	59, 000	.001883	.000033	....	....	
15, 000	60, 000	.001917	.000034	....	....	
15, 250	61, 000	.001950	.000033	....	....	
15, 500	62, 000	.002000	.000050	....	....	Elastic limit.
15, 750	63, 000	.002067	.000067	....	....	
16, 000	64, 000	.002133	.000066	....	....	
16, 250	65, 000	.002200	.000067	....	....	
16, 500	66, 000	.002350	.000150	....	....	
16, 750	67, 000	.002550	.000200	....	....	
17, 000	68, 000	.002917	.000367	....	....	
17, 250	69, 000	.003583	.000666	....	....	
17, 500	70, 000	.004583	.001000	....	....	
18, 000	72, 000	.006667	.002084	....	....	
18, 500	74, 000	.008667	.002000	....	....	
19, 000	76, 000	.010333	.001666	....	....	
19, 500	78, 000	.012167	.001834	....	....	
20, 000	80, 000	.013833	.001666	....	....	
20, 500	82, 000	.015833	.002000	....	....	
21, 000	84, 000	.017667	.001834	....	....	
21, 500	86, 000	.020000	.002333	....	....	
22, 000	88, 000	.022000	.002000	....	....	
22, 500	90, 000	.024167	.002167	....	....	
23, 000	92, 000	.027167	.003000	....	....	
23, 500	94, 000	.0283	.001133	....	....	
24, 000	96, 000	.0317	.0034	....	....	
24, 500	98, 000	.0350	.0033	....	....	
25, 000	100, 000	.0417	.0067	....	....	
25, 500	102, 000	.0483	.0066	....	....	
26, 000	104, 000	.0533	.0050	....	....	
26, 500	106, 000	.0650	.0117	....	....	
27, 000	108, 000	.0833	.0183	....	....	
27, 160	108, 640	.1067	.0234	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 108, 640
Elastic limit per square inch of original section ....do .. 62, 000
Elongation per inch after rupture.. inch.. 0. 1333
Elongation per inch under strain at elastic limit ....do.... .002000
Reduction in diameter at point of rupture ....do.... .094
Reduction in area after rupture, per centum of original section 30. 6
Position of rupture ....″.95 from neck
Character of broken surface..granular; dull, eccentric spot
Elongation of inch sections...″.09, ″.10, ″.11, ″.14″.14, ″.25*

No. 2799.

Marks, $\begin{smallmatrix}10\ R_1\ C_3\\ B\ T_6\ O\end{smallmatrix}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001100	.000150	0.	....	
10,000	40,000	.001267	.000167	0.	....	
11,250	45,000	.001417	.000150	....	....	
12,500	50,000	.001600	.000183	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001767	.000034	....	....	
14,000	56,000	.001800	.000033	....	....	
14,250	57,000	.001833	.000033	....	....	
14,500	58,000	.001867	.000034	....	....	
14,750	59,000	.001917	.000050	....	....	
15,000	60,000	.001967	.000050	....	....	
15,250	61,000	.002017	.000050	....	....	Elastic limit.
15,500	62,000	.002150	.000133	....	....	
15,750	63,000	.002333	.000183	....	....	
16,000	64,000	.002867	.000534	....	....	
16,500	66,000	.004667	.001800	....	....	
17,000	68,000	.006750	.002083	....	....	
17,500	70,000	.008833	.002083	....	....	
18,000	72,000	.010833	.002000	....	....	
18,500	74,000	.012500	.001667	....	....	
19,000	76,000	.014333	.001833	....	....	
19,500	78,000	.016333	.002000	....	....	
20,000	80,000	.018500	.002167	....	....	
20,500	82,000	.020667	.002167	....	....	
21,000	84,000	.023167	.002500	....	....	
21,500	86,000	.025667	.002500	....	....	
22,000	88,000	.028333	.002666	....	....	
22,500	90,000	.031500	.003167	....	....	
23,000	92,000	.0350	.0035	....	....	
23,500	94,000	.0400	.0050	....	....	
24,000	96,000	.0450	.0050	....	....	
24,500	98,000	.0517	.0067	....	....	
25,000	100,000	.0633	.0116	....	....	
25,500	102,000	.0800	.0167	....	....	
25,880	103,520	.1200	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	103,520
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.002017
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		2".35 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		".09, ".12, ".15, ".20*, ".20, ".11

No. 2800.

Marks, $\frac{10\ R_1\ C_6}{B\ T_6\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	....	....	
2,500	10,000	.000250	.000150	....	....	
3,750	15,000	.000400	.000150	....	....	
5,000	20,000	.000550	.000150	....	....	
6,250	25,000	.000717	.000167	....	....	
7,500	30,000	.000900	.000183	....	....	
8,750	35,000	.001067	.000167	....	....	
10,000	40,000	.001250	.000183	....	....	
11,250	45,000	.001400	.000150	....	....	
12,500	50,000	.001567	.000167	....	....	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001650	.000050	....	....	
13,250	53,000	.001667	.000017	....	....	
13,500	54,000	.001700	.000033	....	....	
13,750	55,000	.001733	.000033	....	....	
14,000	56,000	.001767	.000034	....	....	
14,250	57,000	.001817	.000050	....	....	
14,500	58,000	.001850	.000033	....	....	
14,750	59,000	.001900	.000050	....	....	Elastic limit.
15,000	60,000	.001983	.000083	....	....	
15,250	61,000	.002067	.000084	....	....	
15 500	62,000	.002317	.000250	....	....	
15,750	63,000	.002800	.000483	....	....	
16,000	64,000	.003833	.001033	....	....	
16,500	66,000	.006000	.002167	....	....	
17,000	68,000	.008000	.002000	....	....	
17,500	70 000	.009833	.001833	....	....	
18,000	72,000	.011667	.001834	....	....	
18,500	74,000	.013500	.001833	....	....	
19,000	76,000	.015333	.001833	....	....	
19,500	78,000	.017167	.001834	....	....	
20,000	80,000	.019333	.002166	....	....	
20,500	82,000	.021667	.002334	....	....	
21,000	84,000	.024000	.002333	....	....	
21,500	86,000	.026667	.002667	....	....	
22,000	88,000	.029333	.002666	....	....	
22,500	90,000	.0333	.003967	....	....	
23,000	92,000	.0367	.0034	....	....	
23,500	94,000	.0417	.0050	....	....	
24,000	96,000	.0483	.0066	....	....	
24,500	98,000	.0550	.0067	....	....	
25,000	100,000	.0650	.0100	....	....	
25,500	102,000	.0850	.0200	....	....	
25,620	102,480	.1200	.0350	....	....	Tensile strength.

General summary.

Specific gravity		7.8468
Hardness		23.17
Tensile strength per square inch of original section	pounds	102,480
Elastic limit per square inch of original section	do	59,000
Elongation per inch after rupture	inch	0.1400
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1″.20 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.07, ″.08, ″.09, ″.12, ″.32, ″.16
Diameter ″.2 from point of rupture		″.46

No. 3375.

Marks, $\frac{10\ R_1\ C_7}{M\ T_{17}\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001750	.000050	....	....	
13,250	53,000	.001783	.000033	....	....	
13,500	54,000	.001817	.000034	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001917	.000067	....	....	
14,250	57,000	.001950	.000033	....	....	
14,500	58,000	.002000	.000050	....	....	Elastic limit.
14,750	59,000	.002217	.000217	....	....	
15,000	60,000	.003000	.000783	....	....	
15,500	62,000	.004500	.001500	....	....	
16,000	64,000	.005833	.001333	....	....	
16,500	66,000	.007333	.001500	....	....	
17,000	68,000	.008667	.001334	....	....	
17,500	70,000	.009917	.001250	....	....	
18,000	72,000	.011417	.001500	....	....	
18,500	74,000	.012667	.001250	....	....	
19,000	76,000	.014017	.001350	....	....	
19,500	78,000	.015500	.001483	....	....	
20,000	80,000	.017083	.001583	....	....	
20,500	82,000	.018750	.001667	....	....	
21,000	84,000	.020333	.001583	....	....	
21,500	86,000	.022233	.001900	....	....	
22,000	88,000	.024333	.002100	....	....	
22,500	90,000	.026500	.002167	....	....	
23,000	92,000	.028750	.002250	....	....	
23,500	94,000	.031167	.002417	....	....	
24,000	96,000	.034250	.003083	....	....	
24,500	98,000	.037167	.002917	....	....	
25,000	100,000	.040833	.003666	....	....	
25,500	102,000	.0450	.004167	....	....	
26,000	104,000	.0517	.0067	....	....	
26,500	106,000	.0600	.0083	....	....	
27,000	108,000	.0700	.0100	....	....	
27,460	109,840	.1017	.0317	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	109,840
Elastic limit per square inch of original section	do ...	58,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.45 from neck
Character of broken surface		granular; silky spot near circumference
Elongation of inch sections		″.08, ″.09, ″.10, ″.10, ″.24, ″.11

No. 2802.

Marks, $\genfrac{}{}{0pt}{}{10\ R_1\ C_3}{M\ T_5\ O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000933	.000150	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
11,250	45,000	.001417	.000150	....	....	
12,500	50,000	.001600	.000183	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001767	.000034	....	....	
14,000	56,000	.001800	.000033	....	....	
14,250	57,000	.001833	.000033	....	....	
14,500	58,000	.001883	.000050	....	....	
14,750	59,000	.001917	.000034	....	....	
15,000	60,000	.001967	.000050	....	....	Elastic limit.
15,250	61,000	.002033	.000066	....	....	
15,500	62,000	.002133	.000100	....	....	
15,750	63,000	.002233	.000100	....	....	
16,000	64,000	.002417	.000184	....	....	
16,250	65,000	.002733	.000316	....	....	
16,500	66,000	.003400	.000667	....	....	
17,000	68,000	.005167	.001767	....	....	
17,500	70,000	.006833	.001666	....	....	
18,000	72,000	.008500	.001667	....	....	
18,500	74,000	.010167	.001667	....	....	
19,000	76,000	.011833	.001666	....	....	
19,500	78,000	.013500	.001667	....	....	
20,000	80,000	.015167	.001667	....	....	
20,500	82,000	.016833	.001666	....	....	
21,000	84,000	.018833	.002000	....	....	
21,300	86,000	.020833	.002000	....	....	
22,000	88,000	.022833	.002000	....	....	
22,500	90,000	.025167	.002334	....	....	
23,000	92,000	.027833	.002066	....	....	
23,500	94,000	.030500	.002667	....	....	
24,000	96,000	.0350	.0045	....	....	
24,500	98,000	.0383	.0033	....	....	
25,000	100,000	.0433	.0050	....	....	
25,500	102,000	.0483	.0050	....	....	
26,000	104,000	.0517	.0034	....	....	
26,500	106,000	.0617	.0100	....	....	
27,000	108,000	.0783	.0166	....	....	
27,370	109,480	.1167	.0384	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	109,480
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.1467
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1".60 from neck
Character of broken surface		granular, 85 per cent.; silky, 15 per cent.
Elongation of inch sections		".10, ".11, ".12, ".13, ".28*, ".14

No. 3395.

Marks, $\overset{10\ R,\ C}{B\ T_{16}\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000633	.000150	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001833	.000033	....	....	
14,250	57,000	.001867	.000034	....	....	
14,500	58,000	.001900	.000033	....	....	
14,750	59,000	.001933	.000033	....	....	
15,000	60,000	.001983	.000050	....	....	
15,250	61,000	.002017	.000034	....	....	
15,500	62,000	.002050	.000033	....	....	
15,750	63,000	.002083	.000033	....	....	
16,000	64,000	.002117	.000034	....	....	
16,250	65,000	.002167	.000050	....	....	
16,500	66,000	.002217	.000050	....	....	Elastic limit.
16,750	67,000	.002317	.000100	....	....	
17,000	68,000	.002383	.000066	....	....	
17,250	69,000	.002533	.000150	....	....	
17,500	70,000	.002650	.000117	....	....	
17,750	71,000	.002883	.000233	....	....	
18,000	72,000	.003167	.000284	....	....	
18,500	74,000	.003683	.000516	....	....	
19,000	76,000	.004667	.000984	....	....	
19,500	78,000	.005333	.000666	....	....	
20,000	80,000	.007750	.001417	....	....	
20,500	82,000	.009667	.001917	....	....	
21,000	84,000	.011333	.001666	....	....	
21,500	86,000	.013167	.001834	....	....	
22,000	88,000	.014800	.001633	....	....	
22,500	90,000	.016333	.001533	....	....	
23,000	92,000	.018050	.001717	....	....	
23,500	94,000	.019933	.001883	....	....	
24,000	96,000	.022000	.002067	....	....	
24,500	98,000	.0233	.0013	....	....	
25,000	100,000	.0283	.0050	....	....	
25,500	102,000	.0317	.0034	....	....	
26,000	104,000	.0350	.0033	....	....	
26,500	106,000	.0375	.0025	....	....	
27,000	108,000	.0392	.0017	....	....	
27,500	110,000	.0433	.0041	....	....	
28,000	112,000	.0500	.0067	....	....	
28,500	114,000	.0550	.0050	....	....	
29,000	116,000	.0633	.0083	....	....	
29,500	118,000	.0850	.0217	....	....	
29,540	118,160	.0967	.0117	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 118,160
Elastic limit per square inch of original section .... do ... 66,000
Elongation per inch after rupture .... inch.. 0.1167
Elongation per inch under strain at elastic limit .... do.... .002217
Reduction in diameter at point of rupture .... do.... .136
Reduction in area after rupture, per centum of original section .... [illegible]
Position of rupture .... 2".05 from neck
Character of broken surface .... granular; dull spot at the circumference
Elongation of inch sections .... ".09, ".24, ".14, ".09, ".07, "[illegible]

HOOP C_9.

Exterior diameter, 18″.75.
Interior diameter, 12″.50.

No. 3124.

Marks, $^{10}\overset{R_1C_9}{T_1I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000083	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001517	.000200	....	....	
11,500	46,000	.001567	.000050	....	....	
11,750	47,000	.001600	.000033	....	....	
12,000	48,000	.001617	.000017	....	....	
12,250	49,000	.001667	.000050	....	....	
12,500	50,000	.001700	.000033	....	....	
12,750	51,000	.001750	.000050	....	....	
13,000	52,000	.001817	.000067	....	....	Elastic limit.
13,250	53,000	.001067	.000150	....	....	
13,500	54,000	.002167	.000200	....	....	
13,750	55,000	.002417	.000250	....	....	
14,000	56,000	.002733	.000316	....	....	
14,250	57,000	.003017	.000284	....	....	
14,500	58,000	.003367	.000350	....	....	
14,750	59,000	.003750	.000383	....	....	
15,000	60,000	.004217	.000167	....	....	
15,500	62,000	.005500	.001283	....	....	
16,000	64,000	.006800	.001300	....	....	
16,500	66,000	.008050	.001250	....	....	
17,000	68,000	.009383	.001333	....	....	
17,500	70,000	.010667	.001284	....	....	
18,000	72,000	.012133	.001466	....	....	
18,500	74,000	.013500	.001367	....	....	
19,000	76,000	.015050	.001550	....	....	
19,500	78,000	.016517	.001467	....	....	
20,000	80,000	.018217	.001700	....	....	
20,500	82,000	.019800	.001583	....	....	
21,000	84,000	.021500	.001700	....	....	
21,500	86,000	.024133	.002638	....	....	
22,000	88,000	.025633	.001500	....	....	
22,500	90,000	.027967	.002334	....	....	
23,000	92,000	.0317	.003733	....	....	
23,500	94,000	.0333	.0016	....	....	
24,000	96,000	.0367	.0034	....	....	
24,500	98,000	.0400	.0033	....	....	
25,000	100,000	.0467	.0067	....	....	
25,500	102,000	.0500	.0033	....	....	
26,000	104,000	.0567	.0067	....	....	
26,500	106,000	.0667	.0100	....	....	
27,000	108,000	.0833	.0166	....	....	
27,100	108,400	.1017	.0184	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	108,400
Elastic limit per square inch of original section	do	52,000
Elongation per inch after rupture	inch	0.1033
Elongation per inch under strain at elastic limit	do	.001817
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.70 from neck
Character of broken surface		granular; dull eccentric spot
Elongation of inch sections		″.10, ″.07, ″.06, ″.06, ″.10, ″.23*

No. 3125.

Marks, $^{10\,R_1\,C_9}_{\;T_3\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000817	.000150	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001550	.000233	....	....	
11,500	46,000	.001583	.000033	....	....	
11,750	47,000	.001617	.000034	....	....	
12,000	48,000	.001667	.000050	....	....	
12,250	49,000	.001733	.000066	....	....	
12,500	50,000	.001783	.000050	....	....	Elastic limit.
12,750	51,000	.001967	.000184	....	....	
13,000	52,000	.002733	.000766	....	....	
13,250	53,000	.003267	.000534	....	....	
13,500	54,000	.003783	.000516	....	....	
13,750	55,000	.004350	.000567	....	....	
14,000	56,000	.004917	.000567	....	....	
14,250	57,000	.005533	.000616	....	....	
14,500	58,000	.006117	.000584	....	....	
14,750	59,000	.006600	.000483	....	....	
15,000	60,000	.007350	.000750	....	....	
15,500	62,000	.008767	.001417	....	....	
16,000	64,000	.009933	.001166	....	....	
16,500	66,000	.011100	.001167	....	....	
17,000	68,000	.012683	.001583	....	....	
17,500	70,000	.014100	.001417	....	....	
18,000	72,000	.015683	.001583	....	....	
18,500	74,000	.017350	.001667	....	....	
19,000	76,000	.018933	.001583	....	....	
19,500	78,000	.020683	.001750	....	....	
20,000	80,000	.022717	.002034	....	....	
20,500	82,000	.024600	.001883	....	....	
21,000	84,000	.0267	.0021	....	....	
21,500	86,000	.0283	.0016	....	....	
22,000	88,000	.0317	.0034	....	....	
22,500	90,000	.0350	.0033	....	....	
23,000	92,000	.0383	.0033	....	....	
23,500	94,000	.0433	.0050	....	....	
24,000	96,000	.0467	.0034	....	....	
24,500	98,000	.0517	.0050	....	....	
25,000	100,000	.0583	.0066	....	....	
25,500	102,000	.0683	.0100	....	....	
26,000	104,000	.0867	.0184	....	....	
26,400	105,600	.1267	.0400	....	....	Tensile strength.

General summary.

Specific gravity		7.859
Hardness		23.39
Tensile strength per square inch of original section	pounds	105,600
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.1283
Elongation per inch under strain at elastic limit	do	.001783
Reduction in diameter at point of rupture	do	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		1″.15 from neck
Character of broken surface		granular; dull spot at circumference
Elongation of inch sections		″.18, ″.20*, ″.13, ″.12, ″.11, ″.06

No. 3126.

Marks, $^{10\,\mathrm{R},\,\mathrm{C}_3}_{\mathrm{T}_2\,\mathrm{M}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000433	.000150	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000783	.000183	0.	....	
7,500	30,000	.000967	.000184	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	.000017	.000017	
11,250	45,000	.001500	.000167	....	....	
11,500	46,000	.001533	.000033	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001600	.000033	....	....	
12,250	49,000	.001683	.000083	....	....	
12,500	50,000	.001717	.000034	....	....	Elastic limit.
12,750	51,000	.001817	.000100	....	....	
13,000	52,000	.002133	.000316	....	....	
13,250	53,000	.002783	.000650	....	....	
13,500	54,000	.003333	.000550	....	....	
13,750	55,000	.003933	.000600	....	....	
14,000	56,000	.004400	.000467	....	....	
14,250	57,000	.005050	.000650	....	....	
14,500	58,000	.005567	.000517	....	....	
14,750	59,000	.006167	.000600	....	....	
15,000	60,000	.006733	.000566	....	....	
15,500	62,000	.008067	.001334	....	....	
16,000	64,000	.009367	.001300	....	....	
16,500	66,000	.010700	.001333	....	....	
17,000	68,000	.012000	.001300	....	....	
17,500	70,000	.013450	.001450	....	....	
18,000	72,000	.014867	.001417	....	....	
18,500	74,000	.016450	.001583	....	....	
19,000	76,000	.018200	.001750	....	....	
19,500	78,000	.019867	.001667	....	....	
20,000	80,000	.021667	.001800	....	....	
20,500	82,000	.023533	.001866	....	....	
21,000	84,000	.025533	.002000	....	....	
21,500	86,000	.0283	.002767	....	....	
22,000	88,000	.0300	.0017	....	....	
22,500	90,000	.0333	.0033	....	....	
23,000	92,000	.0358	.0025	....	....	
23,500	94,000	.0383	.0025	....	....	
24,000	96,000	.0450	.0067	....	....	
24,500	98,000	.0500	.0050	....	....	
25,000	100,000	.0550	.0050	....	....	
25,500	102,000	.0633	.0083	....	....	
26,000	104,000	.0750	.0117	....	....	
26,500	106,000	.0950	.0200	....	....	
26,800	107,200	.1367	.0417	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	107,200
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.1517
Elongation per inch under strain at elastic limit	do	.001717
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		2″.15 from neck
Character of broken surface		granular; dull center
Elongation of inch sections		″.09, ″.26, ″.17, ″.14, ″.14, ″.11

No. 3234.

Marks, $^{10\ B_1\ C_9}_{T_4\ M}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000283	.000150	0.	....	
3,750	15,000	.000467	.000184	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001133	.000150	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001867	.000067	....	....	
14,250	57,000	.001917	.000050	....	....	
14,500	58,000	.001967	.000050	....	....	
14,750	59,000	.002017	.000050	....	....	Elastic limit.
15,000	60,000	.002200	.000183	....	....	
15,250	61,000	.002500	.000300	....	....	
15,500	62,000	.003250	.000750	....	....	
16,000	64,000	.004500	.001250	....	....	
16,500	66,000	.005783	.001283	....	....	
17,000	68,000	.007083	.001300	....	....	
17,500	70,000	.008200	.001117	....	....	
18,000	72,000	.009667	.001467	....	....	
18,500	74,000	.011083	.001416	....	....	
19,000	76,000	.012283	.001200	....	....	
19,500	78,000	.013783	.001500	....	....	
20,000	80,000	.016033	.002250	....	....	
20,500	82,000	.016783	.000750	....	....	
21,000	84,000	.018667	.001884	....	....	
21,500	86,000	.020283	.001666	....	....	
22,000	88,000	.021950	.001667	....	....	
22,500	90,000	.023617	.001667	....	....	
23,000	92,000	.025783	.002166	....	....	
23,500	94,000	.027917	.002134	....	....	
24,000	96,000	.030333	.002416	....	....	
24,500	98,000	.0333	.002967	....	....	
25,000	100,000	.0358	.0025	....	....	
25,500	102,000	.0383	.0025	....	....	
26,000	104,000	.0450	.0067	....	....	
26,500	106,000	.0500	.0050	....	....	
27,000	108,000	.0550	.0050	....	....	
27,500	110,000	.0633	.0083	....	....	
28,000	112,000	.0800	.0167	....	....	
28,390	113,560	.1100	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	113,560
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1350
Elongation per inch under strain at elastic limit	do....	.002017
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.17 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.10, ″.29*, ″.12, ″.10, ″.10, ″.10

No. 3235.

Marks, $^{10\,R,\,C_9}_{\;\;T_6\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000183	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000450	.000150	0.	....	
5, 000	20, 000	.000650	.000200	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.000983	.000166	0.	....	
8, 750	35, 000	.001150	.000167	0.	....	
10, 000	40, 000	.001317	.000167	0.	....	
11, 250	45, 000	.001500	.000183	....	....	
12, 500	50, 000	.001667	.000167	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001733	.000033	....	....	
13, 250	53, 000	.001767	.000034	....	....	
13, 500	54, 000	.001800	.000033	....	....	
13, 750	55, 000	.001833	.000034	....	....	
14, 000	56, 000	.001883	.000050	....	....	
14, 250	57, 000	.001933	.000050	....	....	
14, 500	58, 000	.001967	.000034	....	....	
14, 750	59, 000	.002017	.000050	....	....	Elastic limit.
15, 000	60, 000	.002117	.000100	....	....	
15, 250	61, 000	.002267	.000150	....	....	
15, 500	62, 000	.002600	.000333	....	....	
15, 750	63, 000	.003017	.000417	....	....	
16, 000	64, 000	.003733	.000716	....	....	
16, 500	66, 000	.005083	.001350	....	....	
17, 000	68, 000	.006417	.001334	....	....	
17, 500	70, 000	.007750	.001333	....	....	
18, 000	72, 000	.009000	.001250	....	....	
18, 500	74, 000	.010417	.001417	....	....	
19, 000	76, 000	.011750	.001333	....	....	
19, 500	78, 000	.013200	.001450	....	....	
20, 000	80, 000	.014667	.001467	....	....	
20, 500	82, 000	.016183	.001566	....	....	
21, 000	84, 000	.017750	.001567	....	....	
21, 500	86, 000	.019533	.001783	....	....	
22, 000	88, 000	.021250	.001717	....	....	
22, 500	90, 000	.023333	.002083	....	....	
23, 000	92, 000	.025333	.002000	....	....	
23, 500	94, 000	.027667	.002334	....	....	
24, 000	96, 000	.029833	.002166	....	....	
24, 500	98, 000	.0333	.003467	....	....	
25, 000	100, 000	.0367	.0034	....	....	
25, 500	102, 000	.0383	.0016	....	....	
26, 000	104, 000	.0433	.0050	....	....	
26, 500	106, 000	.0500	.0067	....	....	
27, 000	108, 000	.0550	.0050	....	....	
27, 500	110, 000	.0633	.0083	....	....	
28, 000	112, 000	.0767	.0134	....	....	
28, 340	113, 360	.1033	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	113, 360
Elastic limit per square inch of original section	do	59, 000
Elongation per inch after rupture	inch	0. 1367
Elongation per inch under strain at elastic limit	do	.002017
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36. 4
Position of rupture		1″.05 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.23*, ″.16, ″.11, ″.11, ″.12, ″.09

No. 3236.

Marks, $\overset{10\ \text{R. C.}}{\text{T. 1}}$
Diameter, ".565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000650	.000183	0.		
6,250	25,000	.000817	.000167	0.		
7,500	30,000	.001000	.000183	0.		
8,750	35,000	.001183	.000183	0.		
10,000	40,000	.001350	.000167	0.		
11,250	45,000	.001500	.000150			
12,500	50,000	.001667	.000167			
12,750	51,000	.001700	.000033			
13,000	52,000	.001733	.000033			
13,250	53,000	.001767	.000034			
13,500	54,000	.001817	.000050			
13,750	55,000	.001850	.000033			
14,000	56,000	.001883	.000033			
14,250	57,000	.001917	.000034			
14,500	58,000	.001967	.000050			
14,750	59,000	.002000	.000033			
15,000	60,000	.002050	.000050			
15,250	61,000	.002083	.000033			
15,500	62,000	.002117	.000034			
15,750	63,000	.002167	.000050			Elastic limit.
16,000	64,000	.002267	.000100			
16,250	65,000	.002350	.000083			
16,500	66,000	.002517	.000167			
16,750	67,000	.002683	.000166			
17,000	68,000	.003000	.000317			
17,500	70,000	.004000	.001000			
18,000	72,000	.005250	.001250			
18,500	74,000	.006667	.001417			
19,000	76,000	.008000	.001333			
19,500	78,000	.009417	.001417			
20,000	80,000	.010750	.001333			
20,500	82,000	.012167	.001417			
21,000	84,000	.013583	.001416			
21,500	86,000	.015083	.001500			
22,000	88,000	.016083	.001500			
22,500	90,000	.018250	.001667			
23,000	92,000	.019833	.001583			
23,500	94,000	.021667	.001834			
24,000	96,000	.023667	.002000			
24,500	98,000	.025417	.001750			
25,000	100,000	.027500	.002083			
25,500	102,000	.0300	.0025			
26,000	104,000	.0333	.0033			
26,500	106,000	.0367	.0034			
27,000	108,000	.0400	.0033			
27,500	110,000	.0450	.0050			
28,000	112,000	.0483	.0033			
28,500	114,000	.0533	.0050			
29,000	116,000	.0650	.0117			
29,500	118,000	.0850	.0200			Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	118,000
Elastic limit per square inch of original section ....do....	63,000
Elongation per inch after rupture ....inch..	0.0683
Elongation per inch under strain at elastic limit ....do....	.002167
Reduction in diameter at point of rupture ....do....	.105
Reduction in area after rupture, per centum of original section	32.5
Position of rupture	".50 from neck
Character of broken surface	granular; silky center
Elongation of inch sections	".08, ".07, ".06, ".07, ".11, ".30

HOOP D_2.

Exterior diameter, 31″.75.
Interior diameter, 21″.50.

No. 2879.

Marks, $\overset{10\,R_1\,D_2}{T_1\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000467	.000150	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001883	.000050	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001967	.000050	....	....	
14,750	59,000	.002017	.000050	....	....	
15,000	60,000	.002067	.000050	....	....	Elastic limit.
15,250	61,000	.002200	.000133	....	....	
15,500	62,000	.003333	.001133	....	....	
15,750	63,000	.004117	.000784	....	....	
16,000	64,000	.005017	.000900	....	....	
16,500	66,000	.006667	.001650	....	....	
17,000	68,000	.008167	.001500	....	....	
17,500	70,000	.009833	.001666	....	....	
18,000	72,000	.011350	.001517	....	....	
18,500	74,000	.013000	.001650	....	....	
19,000	76,000	.014667	.001667	....	....	
19,500	78,000	.016167	.001500	....	....	
20,000	80,000	.017833	.001666	....	....	
20,500	82,000	.019500	.001667	....	....	
21,000	84,000	.021500	.002000	....	....	
21,500	86,000	.023417	.001917	....	....	
22,000	88,000	.025667	.002250	....	....	
22,500	90,000	.028000	.002333	....	....	
23,000	92,000	.029167	.001167	....	....	
23,500	94,000	.0317	.002533	....	....	
24,000	96,000	.0350	.0033	....	....	
24,500	98,000	.0383	.0033	....	....	
25,000	100,000	.0433	.0050	....	....	
25,500	102,000	.0483	.0050	....	....	
26,000	104,000	.0533	.0050	....	....	
26,500	106,000	.0617	.0084	....	....	
27,000	108,000	.0750	.0133	....	....	
27,370	109,480	.1033	.0283	....	....	Tensile strength.

General summary.

Specific gravity		7.8362
Hardness		24.54
Tensile strength per square inch of original section	pounds..	109,480
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.1183
Elongation per inch under strain at elastic limit	do....	.002067
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		2″.75 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
″.45 from point of rupture diameter was		″.50
Elongation of inch sections		″.08, ″.10, ″.17*, ″.17, ″.09

No. 3236.

Marks, $^{10\ \mathrm{R.}\ \mathrm{C.}}_{\ \ \ \mathrm{T.}\ 1}$
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001183	.000183	0.	....	
10,000	40,000	.001350	.000167	0.	....	
11,250	45,000	.001500	.000150	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001817	.000050	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001967	.000050	....	....	
14,750	59,000	.002000	.000033	....	....	
15,000	60,000	.002050	.000050	....	....	
15,250	61,000	.002083	.000033	....	....	
15,500	62,000	.002117	.000034	....	....	
15,750	63,000	.002167	.000050	....	....	Elastic limit.
16,600	64,000	.002267	.000100	....	....	
16,250	65,000	.002350	.000083	....	....	
16,500	66,000	.002517	.000167	....	....	
16,750	67,000	.002683	.000166	....	....	
17,000	68,000	.003000	.000317	....	....	
17,500	70,000	.004000	.001000	....	....	
18,000	72,000	.005250	.001250	....	....	
18,500	74,000	.006667	.001417	....	....	
19,000	76,000	.008000	.001333	....	....	
19,500	78,000	.009417	.001417	....	....	
20,000	80,000	.010750	.001333	....	....	
20,500	82,000	.012167	.001417	....	....	
21,000	84,000	.013583	.001416	....	....	
21,500	86,000	.015083	.001500	....	....	
22,000	88,000	.016083	.001500	....	....	
22,500	90,000	.018250	.001667	....	....	
23,000	92,000	.019833	.001583	....	....	
23,500	94,000	.021667	.001834	....	....	
24,000	96,000	.023667	.002000	....	....	
24,500	98,000	.025417	.001750	....	....	
25,000	100,000	.027500	.002083	....	....	
25,500	102,000	.0300	.0025	....	....	
26,000	104,000	.0333	.0033	....	....	
26,500	106,000	.0367	.0034	....	....	
27,000	108,000	.0400	.0033	....	....	
27,500	110,000	.0450	.0050	....	....	
28,000	112,000	.0483	.0033	....	....	
28,500	114,000	.0533	.0050	....	....	
29,000	116,000	.0650	.0117	....	....	
29,500	118,000	.0850	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 118,000
Elastic limit per square inch of original section..do.... 63,000
Elongation per inch after rupture..inch.. 0.0883
Elongation per inch under strain at elastic limit ....do.... .002167
Reduction in diameter at point of rupture ....do.... .105
Reduction in area after rupture, per centum of original section 33.5
Position of rupture ....″.50 from neck
Character of broken surface..granular; silky center
Elongation of inch sections..″.08, ″.07, ″.06, ″.07, ″.11, ″.30

HOOP D_3.

Exterior diameter, 31″.75.
Interior diameter, 21″.50.

No. 2879.

Marks, $^{10\,\mathrm{R,\,D_3}}_{\mathrm{T,\,M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000467	.000150	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001883	.000050	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001967	.000050	....	....	
14,750	59,000	.002017	.000050	....	....	
15,000	60,000	.002067	.000050	....	....	Elastic limit.
15,250	61,000	.002200	.000133	....	....	
15,500	62,000	.003333	.001133	....	....	
15,750	63,000	.004117	.000784	....	....	
16,000	64,000	.005017	.000900	....	....	
16,500	66,000	.006667	.001650	....	....	
17,000	68,000	.008167	.001500	....	....	
17,500	70,000	.009833	.001666	....	....	
18,000	72,000	.011350	.001517	....	....	
18,500	74,000	.013000	.001650	....	....	
19,000	76,000	.014667	.001667	....	....	
19,500	78,000	.016167	.001500	....	....	
20,000	80,000	.017833	.001666	....	....	
20,500	82,000	.019500	.001667	....	....	
21,000	84,000	.021500	.002000	....	....	
21,500	86,000	.023417	.001917	....	....	
22,000	88 000	.025667	.002250	....	....	
22.500	90,000	.028000	.002333	....	....	
23,000	92,000	.029167	.001167	....	....	
23,500	94,000	.0317	.002533	....	....	
24,000	96,000	.0350	.0033	....	....	
24,500	98,000	.0383	.0033	....	....	
25,000	100,000	.0433	.0050	....	....	
25,500	102,000	.0483	.0050	....	....	
26,000	104,000	.0533	.0050	....	....	
26,500	106,000	.0617	.0084	....	....	
27,000	108,000	.0750	.0133	....	....	
27,370	109,480	.1033	.0283	....	....	Tensile strength.

General summary.

Specific gravity		7.8362
Hardness		24.54
Tensile strength per square inch of original section	pounds	109,480
Elastic limit per square inch of original section	do	60,000
Elongation per inch after rupture	inch	0.1183
Elongation per inch under strain at elastic limit	do	.002067
Reduction in diameter at point of rupture	do	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		2″.75 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
″.45 from point of rupture diameter was		″ 50
Elongation of inch sections		″.08, ″.10, ″.17*, ″.17, ″.09

No. 3004.

Marks, $^{10}{}^{R_1}_{T_4}{}^{D_3}_{I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001917	.000050	....	....	
14,500	58,000	.001950	.000033	....	....	
14,750	59,000	.002000	.000050	....	....	
15,000	60,000	.002017	.000017	....	....	
15,250	61,000	.002050	.000033	....	....	Elastic limit.
15,500	62,000	.002167	.000117	....	....	
15,750	63,000	.002833	.000667	....	....	
16,000	64,000	.004083	.001250	....	....	
16,500	66,000	.005833	.001750	....	....	
17,000	68,000	.007500	.001667	....	....	
17,500	70,000	.009167	.001667	....	....	
18,000	72,000	.010667	.001500	....	....	
18,500	74,000	.012167	.001500	....	....	
19,000	76,000	.013667	.001500	....	....	
19,500	78,000	.015333	.001666	....	....	
20,000	80,000	.017000	.001667	....	....	
20,500	82,000	.018633	.001633	....	....	
21,000	84,000	.020667	.002034	....	....	
21,500	86,000	.022667	.002000	....	....	
22,000	88,000	.024750	.002083	....	....	
22,500	90,000	.026667	.001917	....	....	
23,000	92,000	.029167	.002500	....	....	
23,500	94,000	.032083	.002916	....	....	
24,000	96,000	.034583	.002500	....	....	
24,500	98,000	.037667	.003084	....	....	
25,000	100,000	.0417	.004033	....	....	
25,500	102,000	.0483	.0066	....	....	
26,000	104,000	.0517	.0034	....	....	
26,500	106,000	.0600	.0083	....	....	
27,000	108,000	.0683	.0083	....	....	
27,340	109,360	....	....	....	....	Tensile strength.

General summary.

Specific gravity 7.8083
Hardness 12.30
Tensile strength per square inch of original section .... pounds.. 109,360
Elastic limit per square inch of original section .... do.... 61,000
Elongation per inch after rupture .... inch.. 0.0700
Elongation per inch under strain at elastic limit .... do.... .002050
Reduction in diameter at point of rupture .... do.... .034
Reduction in area after rupture, per centum of original section 11.6
Position of rupture .... ″.28 from neck
Character of broken surface .... granular
Elongation of inch sections .... ″.09*, ″.07, ″.08, ″.07, ″.08, ″.07

NEW HOOP D.

No. 3073.

Marks, $^{10\ \mathrm{R.\ D.}}_{\mathrm{T.\ M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000617	.000184	0.	....	
6,250	25,000	.000800	.000183	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001167	.000184	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001467	.000134	....	....	
12,500	50,000	.001667	.000200	....	....	
12,750	51,000	.001683	.000016	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001883	.000050	....	....	
14,250	57,000	.001917	.000034	....	....	Elastic limit.
14,500	58,000	.001983	.000066	....	....	
14,750	59,000	.008833	.006850	....	....	
15,000	60,000	.009667	.000834	....	....	
15,500	62,000	.011000	.001333	....	....	
16,000	64,000	.012500	.001500	....	....	
16,500	66,000	.014333	.001833	....	....	
17,000	68,000	.016000	.001667	....	....	
17,500	70,000	.017667	.001667	....	....	
18,000	72,000	.019500	.001833	....	....	
18,500	74,000	.021667	.002167	....	....	
19,000	76,000	.023667	.002000	....	....	
19,500	78,000	.026000	.002333	....	....	
20,000	80,000	.028333	.002333	....	....	
20,500	82,000	.031000	.002667	....	....	
21,000	84,000	.0350	.0040	....	....	
21,500	86,000	.0383	.0033	....	....	
22,000	88,000	.0433	.0050	....	....	
22,500	90,000	.0467	.0034	....	....	
23,000	92,000	.0500	.0033	....	....	
23,500	94,000	.0567	.0067	....	....	
24,000	96,000	.0667	.0100	....	....	
24,500	98,000	.0767	.0100	....	....	
24,880	99,520	.0950	.0183	....	....	Tensile strength.

General summary.

Specific gravity		7.8421
Hardness		19.60
Tensile strength per square inch of original section	pounds..	99,520
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.0883
Elongation per inch under strain at elastic limit	do....	.001917
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		1″.20 from neck
Character of broken surface		granular; flaky spot at circumference
Elongation of inch sections		″.08, ″.15*, ″.08, ″.08, ″.07, ″.07

No. 3122.

Marks, $^{10\,\text{R}\,\text{D},}_{\text{T},\,\text{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.		0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001117	.000167	0.	....	
10,000	40,000	.001283	.000166	0.	....	
11,250	45,000	.001450	.000167	....	....	
12,500	50,000	.001617	.000167	....	....	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001700	.000050	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001817	.000050	....	....	
14,000	56,000	.001850	.000033	....	....	Elastic limit.
14,250	57,000	.001933	.000083	....	....	
14,500	58,000	.002232	.000300	....	....	
14,750	59,000	.003167	.000934	....	....	
15,000	60,000	.006333	.003166	....	....	
15,500	62,000	.007617	.001284	....	....	
16,000	64,000	.009000	.001383	....	....	
16,500	66,000	.010583	.001583	....	....	
17,000	68,000	.012000	.001417	....	....	
17,500	70,000	.013533	.001533	....	....	
18,000	72,000	.015083	.001550	....	....	
18,500	74,000	.016917	.001834	....	....	
19,000	76,000	.018533	.001616	....	....	
19,500	78,000	.020583	.002050	....	....	
20,000	80,000	.022583	.002000	....	....	
20,500	82,000	.024583	.002000	....	....	
21,000	84,000	.026833	.002250	....	....	
21,500	86,000	.029583	.002750	....	....	
22,000	88,000	.032000	.002417	....	....	
22,500	90,000	.0367	.0047	....	....	
23,000	92,000	.0400	.0033	....	....	
23,500	94,000	0450	.0050	....	....	
24,000	96,000	.0483	.0033	....	....	
24,500	98,000	.0517	.0034	....	....	
25,000	100,000	.0617	.0100	....	....	
25,500	102,000	.0683	.0066	....	....	
26,000	104,000	.0850	.0167	....	....	
26,320	105,280	.1150	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 105,280
Elastic limit per square inch of original section..........do.... 56,000
Elongation per inch after rupture..........inch.. 0.13500
Elongation per inch under strain at elastic limit..........do.... .001850
Reduction in diameter at point of rupture..........do.... .114
Reduction in area after rupture, per centum of original section.......... 36.4
Position of rupture..........at middle of stem
Character of broken surface..........silky, in part interspersed with fine granulation
Elongation of inch sections.......... ″.08, ″11, ″.18, ″.23, ″.11, ″.10

HOOP D_3.

Exterior diameter, 30″.5.
Interior diameter, 20″.25.

No. 2786.

Marks, $\overset{10\,B_1\,D_3}{T_1\,M}$.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000483	.000183	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001750	.000050	....	....	
13,250	53,000	.001817	.000067	....	....	
13,500	54,000	.001883	.000066	....	....	
13,750	55,000	.001950	.000067	....	....	Elastic limit.
14,000	56,000	.002150	.000200	....	....	
14,250	57,000	.002833	.000683	....	....	
14,500	58,000	.003833	.001000	....	....	
14,750	59,000	.004333	.000500	....	....	
15,000	60,000	.005167	.000834	....	....	
15,500	62,000	.006667	.001500	....	....	
16,000	64,000	.008000	.001333	....	....	
16,500	66,000	.009500	.001500	....	....	
17,000	68,000	.011000	.001500	....	....	
17,500	70,000	.012500	.001500	....	....	
18,000	72,000	.014167	.001667	....	....	
18,500	74,000	.015833	.001666	....	....	
19,000	76,000	.017667	.001834	....	....	
19,500	78,000	.019500	.001833	....	....	
20,000	80,000	.021500	.002000	....	....	
20,500	82,000	.023333	.001833	....	....	
21,000	84,000	.025750	.002417	....	....	
21,500	86,000	.0283	.002550	....	....	
22,000	88,000	.0317	.0034	....	....	
22,500	90,000	.0333	.0016	....	....	
23,000	92,000	.0367	.0034	....	....	
23,500	94,000	.0400	.0033	....	....	
24,000	96,000	.0450	.0050	....	....	
24,500	98,000	.0517	.0067	....	....	
25,000	100,000	.0583	.0066	....	....	
25,500	102,000	.0683	.0100	....	....	
26,000	104,000	.0800	.0117	....	....	
26,380	105,520	.1183	.0383	....	....	Tensile strength.

General summary.

Specific gravity		7.8407
Hardness		22.77
Tensile strength per square inch of original section	pounds..	105,520
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1450
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		¾″ from middle of stem
Character of broken surface		silky; traces of granulation
Elongation of inch sections		″.14, ″.14, ″.30*, ″.11, ″.10, ″.08

NEW HOOP D_3.

No. 2810.

Marks, $^{10}\overset{R_1 D_3}{T_5 M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000267	.000150	0.	....	
3,750	15,000	.000417	.000150	0.	....	
5,000	20,000	.000600	.000183	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000917	.000184	0.	....	
8,750	35,000	.001067	.000150	0.	....	
10,000	40,000	.001250	.000183	0.	....	
11,250	45,000	.001417	.000167	....	....	
12,500	50,000	.001600	.000183	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001650	.000017	....	....	
13,250	53,000	.001683	.000033	....	....	
13,500	54,000	.001733	.000050	....	....	
13,750	55,000	.001767	.000034	....	....	
14,000	56,000	.001817	.000050	....	....	
14,250	57,000	.001850	.000033	....	....	
14,500	58,000	.001917	.000067	....	....	Elastic limit.
14,750	59,000	.002000	.000083	....	....	
15,000	60,000	.002250	.000250	....	....	
15,250	61,000	.002750	.000500	....	....	
15,500	62,000	.003333	.000583	....	....	
15,750	63,000	.003833	.000500	....	....	
16,000	64,000	.004583	.000750	....	....	
16,500	66,000	.006083	.001500	....	....	
17,000	68,000	.007500	.001417	....	....	
17,500	70,000	.009083	.001583	....	....	
18,000	72,000	.010500	.001417	....	....	
18,500	74,000	.012167	.001667	....	....	
19,000	76,000	.013667	.001500	....	....	
19,500	78,000	.015333	.001666	....	....	
20,000	80,000	.017167	.001834	....	....	
20,500	82,000	.018917	.001750	....	....	
21,000	84,000	.020833	.001916	....	....	
21,500	86,000	.022667	.001834	....	....	
22,000	88,000	.024833	.002166	....	....	
22,500	90,000	.027000	.002167	....	....	
23,000	92,000	.029667	.002667	....	....	
23,500	94,000	.0333	.003633	....	....	
24,500	96,000	.0367	.0034	....	....	
24,500	98,000	.0400	.0033	....	....	
25,000	100,000	.0450	.0050	....	....	
25,500	102,000	.0500	.0050	....	....	
26,000	104,000	.0550	.0050	....	....	
26,500	106,000	.0617	.0067	....	....	
27,000	108,000	.0700	.0083	....	....	
27,500	110,000	.0933	.0233	....	....	
27,530	110,120	.1050	.0117	....	....	Tensile strength.

General summary.

Specific gravity	7.8445
Hardness	25.84
Tensile strength per square inch of original section ......pounds..	110,120
Elastic limit per square inch of original section ......do....	58,000
Elongation per inch after rupture ......inch..	0.1300
Elongation per inch under strain at elastic limit ......do....	.001917
Reduction in diameter at point of rupture ......do....	.114
Reduction in area after rupture, per centum of original section	36.4
Position of rupture	2″.4 from neck
Character of broken surface	granular, 60 per cent; silky, 40 per cent.
Elongation of inch sections	″.08, ″.09, ″.10, ″.24,* ″.17, ″.16

THIRD HOOP D$_3$.

No. 3002.

Marks, $\frac{10\,R_1\,D_3}{T_{13}\,1}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001017	.000184	0.	....	
8,750	35,000	.001183	.000166	.000017	.000017	
10,000	40,000	.001367	.000184	.000033	.000016	
11,250	45,000	.001517	.000150	....	....	
12,500	50,000	.001700	.000183	....	....	
12,750	51,000	.001717	.000017	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001850	.000050	....	....	
13,750	55,000	.001867	.000017	....	....	
14,000	56,000	.001933	.000066	....	....	
14,250	57,000	.001967	.000034	....	....	
14,500	58,000	.002000	.000033	....	....	
14,750	59,000	.002033	.000033	....	....	Elastic limit.
15,000	60,000	.007667	.005634	....	....	
15,500	62,000	.008833	.001166	....	....	
16,000	64,000	.010417	.001584	....	....	
16,500	66,000	.011833	.001416	....	....	
17,000	68,000	.013533	.001700	....	....	
17,500	70,000	.015167	.001634	....	....	
18,000	72,000	.016867	.001700	....	....	
18,500	74,000	.018667	.001800	....	....	
19,000	76,000	.020667	.002000	....	....	
19,500	78,000	.022500	.001833	....	....	
20,000	80,000	.024667	.002167	....	....	
20,500	82,000	.027333	.002666	....	....	
21,000	84,000	.029667	.002334	....	....	
21,500	86,000	.032333	.002666	....	....	
22,000	88,000	.035333	.003000	....	....	
22,500	90,000	.038167	.002834	....	....	
23,000	92,000	.0433	.005133	....	....	
23,500	94,000	.0500	.0067	....	....	
24,000	96,000	.0550	.0050	....	....	
24,500	98,000	.0617	0067	....	....	
25,000	100,000	.0683	.0066	....	....	
25,500	102,000	.0850	.0167	....	....	
25,930	103,720	.1200	.0350	....	....	Tensile strength.

General summary.

Specific gravity	7.8364
Hardness	20.36
Tensile strength per square inch of original section ....pounds..	103,720
Elastic limit per square inch of original section ....do....	59,000
Elongation per inch after rupture ....inch..	0.1567
Elongation per inch under strain at elastic limit ....do....	.002033
Reduction in diameter at point of rupture ....do....	.134
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	1″.40 from neck
Character of broken surface	silky
Elongation of inch sections	″.09, ″.11, ″.12, ″.13, ″.32*, ″.17

HOOP D_4.

Exterior diameter, 29″.25.
Interior diameter, 20″.25.

No. 2788.

Marks, $^{10}\genfrac{}{}{0pt}{}{R_1 D_4}{T_1 M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	—.000017	—.000017	
2,500	10,000	.000267	.000150	—.000017	0.	
3,750	15,000	.000433	.000166	—.000017	0.	
5,000	20,000	.000600	.000167	—.000017	0.	
6,250	25,000	.000750	.000150	—.000017	0.	
7,500	30,000	.000917	.000167	—.000017	0.	
8,750	35,000	.001083	.000166	—.000033	—.000016	
10,000	40,000	.001250	.000167	—.000033	0.	
11,250	45,000	.001417	.000167	....	....	
12,500	50,000	.001583	.000166	....	....	
12,750	51,000	.001617	.000034	....	....	
13,000	52,000	.001667	.000050	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001750	.000050	....	....	
13,750	55,000	.001800	.000050	....	....	
14,000	56,000	.001850	.000050	....	....	
14,250	57,000	.001933	.000083	....	....	Elastic limit.
14,500	58,000	.002667	.000734	....	....	
14,750	59,000	.003417	.000750	....	....	
15,000	60,000	.005500	.002083	....	....	
15,500	62,000	.007167	.001667	....	....	
16,000	64,000	.008667	.001500	....	....	
16,500	66,000	.010333	.001666	....	....	
17,000	68,000	.012000	.001667	....	....	
17,500	70,000	.013667	.001667	....	....	
18,000	72,000	.015500	.001833	....	....	
18,500	74,000	.017333	.001833	....	....	
19,000	76,000	.019333	.002000	....	....	
19,500	78,000	.021333	.002000	....	....	
20,000	80,000	.023500	.002167	....	....	
20,500	82,000	.025833	.002333	....	....	
21,000	84,000	.028167	.002334	....	....	
21,500	86,000	.0333	.005133	....	....	
22,000	88,000	.0367	.0034	....	....	
22,500	90,000	.0400	.0033	....	....	
23,000	92,000	.0433	.0033	....	....	
23,500	94,000	.0483	.0050	....	....	
24,000	96,060	.0550	.0067	....	....	
24,500	98,000	.0600	.0050	....	....	
25,000	100,000	.0700	.0100	....	....	
25,500	102,000	.0850	.0150	....	....	
25,880	103,520	.1167	.0317	....	....	Tensile strength.

General summary.

Specific gravity		7.8302
Hardness		21.53
Tensile strength per square inch of original section	pounds..	103,520
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1400
Elongation per inch under strain at elastic limit	do....	.001933
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.31*, ″.14, ″.09, ″.11, ″.08, ″.10

NEW HOOP D_4.

No. 2830.

Marks, $\frac{^{10}B_1D_4}{T_5M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117			
2, 500	10, 000	.000267	.000150			
3, 750	15, 000	.000433	.000166			
5, 000	20, 000	.000600	.000167	0.		
6, 250	25, 000	.000767	.000167			
7, 500	30, 000	.000933	.000166			
8, 750	35, 000	.001100	.000167			
10, 000	40, 000	.001267	.000167	0.		
11, 250	45, 000	.001433	.000166			
12, 500	50, 000	.001600	.000167			
12, 750	51, 000	.001650	.000050			
13, 000	52, 000	.001683	.000033			
13, 250	53, 000	.001717	.000034			
13, 500	54, 000	.001750	.000033			
13, 750	55, 000	.001783	.000033			
14, 000	56, 000	.001817	.000034			
14, 250	57, 000	.001850	.000033			
14, 500	58, 000	.001883	.000033			
14, 750	59, 000	.001917	.000034			
15, 000	60, 000	.001967	.000050			
15, 250	61, 000	.002017	.000050			
15, 500	62, 000	.002083	.000066			
15, 750	63, 000	.002133	.000050			Elastic limit.
16, 000	64, 000	.002400	.000267			
16, 250	65, 000	.002683	.000283			
16, 500	66, 000	.003683	.001000			
16, 750	67, 000	.004683	.001000			
17, 000	68, 000	.005350	.000667			
17, 500	70, 000	.006850	.001500			
18, 000	72, 000	.008350	.001500			
18, 500	74, 000	.010017	.001667			
19, 000	76, 000	.011350	.001333			
19, 500	78, 000	.012850	.001500			
20, 000	80, 000	.014683	.001833			
20, 500	82, 000	.016350	.001667			
21, 000	84, 000	.018183	.001833			
21, 500	86, 000	.019850	.001667			
22, 000	88, 000	.021850	.002000			
22, 500	90, 000	.023850	.002000			
23, 000	92, 000	.026017	.002167			
23, 500	94, 000	.028350	.002333			
24, 000	96, 000	.030850	.002500			
24, 500	98, 000	.0367	.005850			
25, 000	100, 000	.0400	.0033			
25, 500	102, 000	.0433	.0033			
26, 000	104, 000	.0467	.0034			
26, 500	106, 000	.0508	.0041			
27, 000	108, 000	.0583	.0075			
27, 500	110, 000	.0683	.0100			
27, 680	110, 720					Tensile strength.

General summary.

Specific gravity		7.8381
Hardness		23.70
Tensile strength per square inch of original section	pounds	110, 720
Elastic limit per square inch of original section	do	63, 000
Elongation per inch after rupture	inch	0.0683
Elongation per inch under strain at elastic limit	do	.002133
Reduction in diameter at point of rupture	do	.034
Reduction in area after rupture, per centum of original section		11.8
Position of rupture		1″.4 from neck
Character of broken surface		granular; opened cracks in surface of stem
Elongation of inch sections		″.07, ″.08*, ″.06, ″.06, ″.06, ″.06

No. 2849.

Marks, $^{10}\overset{\text{B, D}_4}{\text{T}_6\text{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	.0	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000333	.000183	0.		
3,750	15,000	.000483	.000150	0.		
5,000	20,000	.000650	.000167	0.		
6,250	25,000	.000800	.000150	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001300	.000167	0.		
11,250	45,000	.001483	.000183			
12,500	50,000	.001667	.000184			
12,750	51,000	.001700	.000033			
13,000	52,000	.001733	.000033			
13,250	53,000	.001767	.000034			
13,500	54,000	.001817	.000050			
13,750	55,000	.001850	.000033			
14,000	56,000	.001900	.000050			
14,250	57,000	.001933	.000033			
14,500	58,000	.001983	.000050			
14,750	59,000	.002033	.000050			Elastic limit.
15,000	60,000	.002117	.000084			
15,250	61,000	.002217	.000100			
15,500	62,000	.002467	.000250			
15,750	63,000	.002833	.000366			
16,000	64,000	.003617	.000784			
16,500	66,000	.005100	.001483			
17,000	68,000	.006667	.001567			
17,500	70,000	.008333	.001666			
18,000	72,000	.009833	.001500			
18,500	74,000	.011500	.001667			
19,000	76,000	.013267	.001767			
19,500	78,000	.015000	.001733			
20,000	80,000	.016667	.001667			
20,500	82,000	.018500	.001833			
21,000	84,000	.020467	.001967			
21,500	86,000	.022500	.002033			
22,000	88,000	.024667	.002167			
22,500	90,000	.027167	.002500			
23,000	92,000	.029367	.002200			
23,500	94,000	.0333	.003933			
24,000	96,000	.0367	.0034			
24,500	98,000	.0400	.0033			
25,000	100,000	.0450	.0050			
25,500	102,000	.0500	.0050			
26,000	104,000	.0550	.0050			
26,500	106,000	.0617	.0067			
27,000	108,000	.0700	.0083			
27,460	109,840	.0950	.0250			Tensile strength.

General summary.

Specific gravity		7.8415
Hardness		23.30
Tensile strength per square inch of original section	pounds	109,840
Elastic limit per square inch of original section	do	59,000
Elongation per inch after rupture	inch	0.1150
Elongation per inch under strain at elastic limit	do	.002033
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		38.4
Position of rupture		1″ from neck
Character of broken surface		granular, 60 per cent.; silky center, 40 per cent.
Elongation of inch sections		″.07, ″.08, ″.08, ″.07, ″.13, ″.26

THIRD HOOP D_4.

No. 3019.

Marks, $\frac{10\ R_1\ D_4}{T\ _{10}M}$.
Diameter, ″.565.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.009117	.009117	0.	....	
2, 500	10, 000	.000238	.000166	0.	....	
3, 750	15, 000	.000450	.000167	0.	....	
5, 000	20, 000	.000617	.000167	0.	....	
6, 250	25, 000	.000783	.000166	0.	....	
7, 500	30, 000	.000933	.000150	0.	....	
8, 750	35, 000	.001117	.000184	0.	....	
10, 000	40, 000	.901288	.000166	....	....	
11, 250	45, 000	.001433	.000150	....	....	
12, 500	50, 000	.001600	.000167	....	....	
12, 750	51, 000	.001617	.000017	....	....	
13, 000	52, 000	.001667	.000050	....	....	
13, 250	53, 000	.001700	.000033	....	....	
13, 500	54, 000	.001750	.000050	....	....	
13, 750	55, 000	.001783	.000033	....	....	
14, 000	56, 000	.001817	.000034	....	....	
14, 250	57, 000	.001850	.000033	....	....	
14, 500	58, 000	.001883	.000033	....	....	Elastic limit.
14, 750	59, 000	.001983	.000100	....	....	
15, 000	60, 000	.003583	.001600	....	....	
15, 500	62, 000	.005333	.001750	....	....	
16, 000	64, 000	.006783	.001450	....	....	
16, 500	66, 000	.008250	.001467	....	....	
17, 000	68, 000	.009783	.001533	....	....	
17, 500	70, 000	.011250	.001467	....	....	
18, 000	72, 000	.012750	.001500	....	....	
18, 500	74, 000	.014333	.001583	....	....	
19, 000	76, 000	.016000	.001667	....	....	
19, 500	78, 000	.017833	.001833	....	....	
20, 000	80, 000	.019583	.001750	....	....	
20, 500	82, 000	.021417	.001834	....	....	
21, 000	84, 000	.023333	.001916	....	....	
21, 500	86, 000	.025433	.002100	....	....	
22, 000	88, 000	.027583	.002150	....	....	
22, 500	90, 000	.030050	.002467	....	....	
23, 000	92, 000	.0333	.003250	....	....	
23, 500	94, 000	.0367	.0034	....	....	
24, 000	96, 000	.0400	.0033	....	....	
24, 500	98, 000	.0433	.0033	....	....	
25, 000	100, 000	.0483	.0050	....	....	
25, 500	102, 000	.0550	.0067	....	....	
26, 000	104, 000	.0617	.0067	....	....	
26, 500	106, 000	.0700	.0083	....	....	
27, 000	108, 000	.0933	.0233	....	....	
27, 080	108, 320	.1067	.0134	....	....	Tensile strength.

General summary.

Specific gravity	7. 8388
Hardness	23. 30
Tensile strength per square inch of original section ....pounds..	108, 320
Elastic limit per square inch of original section ....do....	58, 000
Elongation per inch after rupture ....inch..	0. 1383
Elongation per inch under strain at elastic limit ....do....	.001883
Reduction in diameter at point of rupture ....do....	.125
Reduction in area after rupture, per centum of original section	89. 2
Position of rupture	″2.90 from neck
Character of broken surface	granular at circumferenc; silky center
Elongation of inch sections	″.08, ″.13, ″.14, ″.29*, ″.10, ″.00

FOURTH HOOP D_4.

No. 3108.

Marks, $\overset{10\,B_1\,D_4}{T_{18}\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000150	.000150	0.	....	
2, 500	10, 000	.000317	.000167	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000650	.000167	0.	....	
6, 250	25, 000	.000817	.000167	0.	....	
7, 500	30, 000	.000983	.000166	0.	....	
8, 750	35, 000	.001150	.000167	0.	....	
10, 000	40, 000	.001333	.000183	.000017	.000017	
11, 250	45, 000	.001483	.000150	....	....	
12, 500	50, 000	.001667	.000184	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001750	.000050	....	....	
13, 250	53, 000	.001800	.000050	....	....	Elastic limit.
13, 500	54, 000	.003300	.001500	....	....	
13, 750	55, 000	.004133	.000833	....	....	
14, 000	56, 000	.006450	.002317	....	....	
14, 250	57, 000	.007000	.000550	....	....	
14, 500	58, 000	.007617	.000617	....	....	
14, 750	59, 000	.008167	.000550	....	....	
15, 000	60, 000	.009083	.000916	....	....	
15, 500	62, 000	.010583	.001500	....	....	
16, 000	64, 000	.012167	.001584	....	....	
16, 500	66, 000	.013833	.001666	....	....	
17, 000	68, 000	.015417	.001584	....	....	
17, 500	70, 000	.017333	.001916	....	....	
18, 000	72, 000	.019333	.002000	....	....	
18, 500	74, 000	.021417	.002084	....	....	
19, 000	76, 000	.023700	.002283	....	....	
19, 500	78, 000	.025833	.002133	....	....	
20, 000	80, 000	.028333	.002500	....	....	
20, 500	82, 000	.030417	.002084	....	....	
21, 000	84, 000	.033333	.002916	....	....	
21, 500	86, 000	.0367	.003367	....	....	
22, 000	88, 000	.0417	.0050	....	....	
22, 500	90, 000	.0467	.0050	....	....	
23, 000	92, 000	.0517	.0050	....	....	
23, 500	94, 000	.0593	.0066	....	....	
24, 000	96, 000	.0667	.0084	....	....	
24, 500	98, 000	.0800	.0133	....	....	
24, 960	99, 840	.1133	.0 33	....	....	Tensile strength.

General summary.

Specific gravity		7.8499
Hardness		19.60
Tensile strength per square inch of original section	pounds	99,840
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.1367
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2".25 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		".09, ".11, ".10, ".21, ".21, ".10

FIFTH HOOP D₄.

No. 3123.

Marks, $^{10\,B_1\,D_4}_{T_{17}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000467	.000184	0.	....	
5,000	20,000	.000683	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001633	.000150	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001750	.000050	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001833	.000050	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001950	.000050	....	....	Elastic limit.
14,750	59,000	.002067	.000117	....	....	
15,000	60,000	.011150	.009083	....	....	
15,500	62,000	.012517	.001367	....	....	
16,000	64,000	.014033	.001516	....	....	
16,500	66,000	.015817	.001784	....	....	
17,000	68,000	.017550	.001733	....	....	
17,500	70,000	.019383	.001833	....	....	
18,000	72,000	.021383	.002000	....	....	
18,500	74,000	.023567	.002184	....	....	
19,000	76,000	.025783	.002216	....	....	
19,500	78,000	.0283	.002517	....	....	
20,000	80,000	.0317	.0034	....	....	
20,500	82,000	.0350	.0033	....	....	
21,000	84,000	.0375	.0025	....	....	
21,500	86,000	.0400	.0025	....	....	
22,000	88,000	.0467	.0067	....	....	
22,500	90,000	.0517	.0050	....	....	
23,000	92,000	.0583	.0066	....	....	
23,500	94,000	.0667	.0084	....	....	
24,000	96,000	.0783	.0116	....	....	
24,500	98,000	.0967	.0184	....	....	
24,900	99,600	.1300	.0333	....	....	Tensile strength.

General summary.

Specific gravity	7.8450
Hardness	19.81
Tensile strength per square inch of original section .... pounds..	99,600
Elastic limit per square inch of original section .... do....	58,000
Elongation per inch after rupture .... inch..	0.1300
Elongation per inch under strain at elastic limit .... do ...	.001950
Reduction in diameter at point of rupture .... do....	.054
Reduction in area after rupture, per centum of original section	18.3
Position of rupture	1″.50 from neck
Character of broken surface	granular; dull spot at circumference
Elongation of inch sections	″.10, ″.18, ″.15, ″.13, ″.11, ″.11

BREECH-BLOCK.

No. 2920.

Marks, $^{10}{}^{B_1}_{T_1}{}^{B}_{M}{}^{B}$
Diameter, ″.564.
Sectional area, .25 square inch.

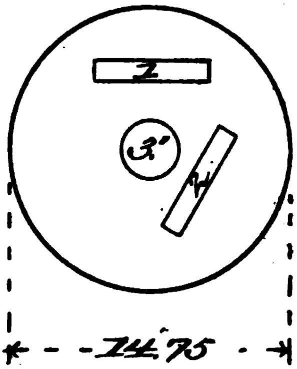
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001533	.000200	....	....	
11,500	46,000	.001600	.000067	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001667	.000034	....	....	Elastic limit.
12,250	49,000	.001767	.000100	....	....	
12,500	50,000	.002000	.000233	....	....	
12,750	51,000	.002567	.000567	....	....	
13,000	52,000	.003067	.000500	....	....	
13,250	53,000	.003633	.000566	....	....	
13,500	54,000	.004367	.000734	....	....	
13,750	55,000	.004800	.000433	....	....	
14,000	56,000	.005333	.000533	....	....	
14,250	57,000	.005967	.000634	....	....	
14,500	58,000	.006633	.000666	....	....	
14,750	59,000	.007267	.000634	....	....	
15,000	60,000	.008000	.000733	....	....	
15,500	62,000	.009567	.001567	....	....	
16,000	64,000	.010900	.001333	....	....	
16,500	66,000	.012367	.001467	....	....	
17,000	68,000	.014000	.001633	....	....	
17,500	70,000	.015733	.001733	....	....	
18,000	72,000	.017500	.001767	....	....	
18,500	74,000	.019333	.001833	....	....	
19,000	76,000	.022333	.003000	....	....	
19,500	78,000	.023333	.001000	....	....	
20,000	80,000	.025500	.002167	....	....	
20,500	82,000	.028167	.002667	....	....	
21,000	84,000	.030667	.002500	....	....	
21,500	86,000	.033500	.002833	....	....	
22,000	88,000	.036667	.003167	....	....	
22,500	90,000	.040333	.003666	....	....	
23,000	92,000	.044667	.004334	....	....	
23,500	94,000	.0467	.002033	....	....	
24,000	96,000	.0533	.0066	....	....	
24,500	98,000	.0633	.0100	....	....	
24,940	99,760	....	....	....	....	Tensile strength.

General summary.

Specific gravity.. 7.8533
Hardness.. 20.47
Tensile strength per square inch of original section..................................pounds.. 99,760
Elastic limit per square inch of original section..do.... 48,000
Elongation per inch after rupture ....inch.. 0.0667
Elongation per inch under strain at elastic limit..do.... .001667
Reduction in diameter at point of rupture...do.... .034
Reduction in area after rupture, per centum of original section 11.8
Position of rupture...1″.50 from neck
Character of broken surface..granular; flaky spot at circumference. Opened small cracks in the surface of the stem.
Elongation of inch sections...″.06, ″.06, ″.06

10 inch steel B. L. Rifle

Breech block



No. 2936.

Marks, $^{10}\,\overset{R_1\,B\,B}{T\,2_1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
10,000	40,000	.001300	.000167	....	....	
10,250	41,000	.001267	.000067	....	....	
10,500	42,000	.001433	.000066	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001533	.000033	....	....	
11,500	46,000	.001600	.000067	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001667	.000034	....	....	Elastic limit not well defined.
12,250	49,000	.001767	.000100	....	....	
12,500	50,000	.001833	.000066	....	....	
12,750	51,000	.001933	.000100	....	....	
13,000	52,000	.002000	.000067	....	....	
13,250	53,000	.002200	.000200	....	....	
13,500	54,000	.002633	.000433	....	....	
13,750	55,000	.003067	.000434	....	....	
14,000	56,000	.003600	.000533	....	....	
14,250	57,000	.004100	.000500	....	....	
14,500	58,000	.004733	.000633	....	....	
14,750	59,000	.005333	.000600	....	....	
15,000	60,000	.006167	.000834	....	....	
15,500	62,000	.007900	.001733	....	....	
16,000	64,000	.009267	.001367	....	....	
16,500	66,000	.010700	.001433	....	....	
17,000	68,000	.012333	.001633	....	....	
17,500	70,000	.013900	.001567	....	....	
18,000	72,000	.015600	.001700	....	....	
18,500	74,000	.017367	.001767	....	....	
19,000	76,000	.019000	.001633	....	....	
19,500	78,000	.021100	.002100	....	....	
20,000	80,000	.023133	.002033	....	....	
20,500	82,000	.025400	.002267	....	....	
21,000	84,000	.027833	.002433	....	....	
21,500	86,000	.030333	.002500	....	....	
22,000	88,000	.033333	.003000	....	....	
22,500	90,000	.036600	.003267	....	....	
23,000	92,000	.040167	.003567	....	....	
23,500	94,000	.0433	.003133	....	....	
24,000	96,000	.0483	.0050	....	....	
24,500	98,000	.0567	.0084	....	....	
25,000	100,000	.0667	.0100	....	....	
25,500	102,000	.0767	.0100	....	....	
25,700	102,800	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	102,800
Elastic limit per square inch of original section (not well defined)	do	48,000
Elongation per inch after rupture	inch	0.0800
Elongation per inch under strain at elastic limit	do	.001667
Reduction in diameter at point of rupture	do	.034
Reduction in area after rupture, per centum of original section		11.8
Position of rupture		1″.30 from neck

Character of broken surface..granular, radiating from a flaky spot at the circumference. Opened fine cracks in surface of stem.
Elongation of inch sections ....″.06, ″.10*, ″.08

BREECH-BLOCK, NEW FORGING.

No. 3163.

Marks, $^{10}\overset{\text{R, B B}}{\text{T, I}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000633	.000200	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.001000	.000200	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001567	.000234	....	....	
11, 500	46, 000	.001600	.000033	....	....	
11, 750	47, 000	.001667	.000067	....	....	
12, 000	48, 000	.001733	.000066	....	....	
12, 250	49, 000	.001800	.000067	....	....	Elastic limit.
12, 500	50, 000	.002267	.000467	....	....	
12, 750	51, 000	.003200	.000933	....	....	
13, 000	52, 000	.004100	.000900	....	....	
13, 250	53, 000	.004833	.000733	....	....	
13, 500	54, 000	.005533	.000700	....	....	
13, 750	55, 000	.006267	.000734	....	....	
14, 000	56, 000	.007233	.000966	....	....	
14, 250	57, 000	.008000	.000767	....	....	
14, 500	58, 000	.008833	.000833	....	....	
14, 750	59, 000	.009533	.000700	....	....	
15, 000	60, 000	.010567	.001034	....	....	
15, 500	62, 000	.012367	.001800	....	....	
16, 000	64, 000	.014067	.001700	....	....	
16, 500	66, 000	.016000	.001933	....	....	
17, 000	68, 000	.017833	.001833	....	....	
17, 500	70, 000	.020000	.002167	....	....	
18, 000	72, 000	.022167	.002167	....	....	
18, 500	74, 000	.024467	.002300	....	....	
19, 000	76, 000	.026867	.002400	....	....	
19, 500	78, 000	.029500	.002633	....	....	
20, 000	80, 000	.032667	.003167	....	....	
20, 500	82, 000	.035833	.003166	....	....	
21, 000	84, 000	.039467	.003634	....	....	
21, 500	86, 000	.044267	.004800	....	....	
22, 000	88, 000	.0500	.005733	....	....	
22, 500	90, 000	.0567	.0067	....	....	
23, 000	92, 000	.0633	.0066	....	....	
53, 500	94, 000	.0733	.0100	....	....	
24, 000	96, 000	.1000	.0267	....	....	
24, 240	96, 960	.1300	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 96, 960
Elastic limit per square inch of original section ....do ... 49, 000
Elongation per inch after rupture ....inch .. 0. 186
Elongation per inch under strain at elastic limit ....do.... .001800
Reduction in diameter at point of rupture ....do.... .114
Reduction in area after rupture, per centum of original section 38.4
Position of rupture ....1".65 from neck
Character of broken surface ....silky, 50 per cent.; granular, 50 per cent.
Elongation of inch sections............................".11, ".30, ".15

No. 3164.

Marks, $^{10\,B_1\,B\,B}_{\quad T_4\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000567	.000134	0.		
6,250	25,000	.000733	.000166	0.		
7,500	30,000	.000900	.000167	0.		
8,750	35,000	.001067	.000167	0.		
10,000	40,000	.001233	.000166	0.		
11,250	45,000	.001433	.000200			
11,500	46,000	.001467	.000034			
11,750	47,000	.001533	.000066			
12,000	48,000	.001600	.000067			
12,250	49,000	.001633	.000033			
12,500	50,000	.001700	.000067			
12,750	51,000	.001767	.000067			
13,000	52,000	.001800	.000033			
13,250	53,000	.001833	.000033			
13,500	54,000	.001900	.000067			
13,750	55,000	.002000	.000100			Elastic limit.
14,000	56,000	.002167	.000167			
14,250	57,000	.002467	.000300			
14,500	58,000	.003000	.000533			
14,750	59,000	.003833	.000833			
15,000	60,000	.005067	.001234			
15,500	62,000	.007167	.002100			
16,000	64,000	.009000	.001833			
16,500	66,000	.010667	.001667			
17,000	68,000	.012333	.001666			
17,500	70,000	.014000	.001667			
18,000	72,000	.015667	.001667			
18,500	74,000	.017733	.002066			
19,000	76,000	.019567	.001834			
19,500	78,000	.022000	.002433			
20,000	80,000	.024100	.002100			
20,500	82,000	.026667	.002567			
21,000	84,000	.029200	.002533			
21,500	86,000	.032533	.003333			
22,000	88,000	.035833	.003300			
22,500	90,000	.039333	.003500			
23,000	92,000	.0433	.003967			
23,500	94,000	.0500	.0067			
24,000	96,000	.0567	.0067			
24,500	98,000	.0667	.0100			
25,000	100,000	.0833	.0166			
25,230	100,920	.1133	.0300			Tensile strength.

General summary.

Tensile strength per square inch of original section......pounds..	100,920
Elastic limit per square inch of original section......do....	55,000
Elongation per inch after rupture......inch..	0.1767
Elongation per inch under strain at elastic limit......do....	.002000
Reduction in diameter at point of rupture......do....	.134
Reduction in area after rupture, per centum of original section......	41.9
Position of rupture......	″.85 from neck
Character of broken surface......	silky
Elongation of inch sections......	″.09, ″.13, ″.31*

No. 3165.

Marks, $^{10}\overset{R_1}{T_1}\overset{BB}{M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000333	.000200	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000867	.000200	0.	....	
7, 500	30, 000	.001033	.000166	0.	....	
8, 750	35, 000	.001233	.000200	.000033	.000033	
10, 000	40, 000	.001400	.000167	.000033	0.	
10, 250	41, 000	.001433	.000033	....	....	
10, 500	42, 000	.001467	.000034	....	....	
10, 750	43, 000	.001533	.000066	....	....	
11, 000	44, 000	.001600	.000067	....	....	
11, 250	45, 000	.001633	.000033	....	....	
11, 500	46, 000	.001700	.000067	....	....	
11, 750	47, 000	.001767	.000067	....	....	
12, 000	48, 000	.001800	.000033	....	....	Elastic limit.
12, 250	49, 000	.001933	.000133	....	....	
12, 500	50, 000	.002367	.000434	....	....	
12, 750	51, 000	.003033	.000666	....	....	
13, 000	52, 000	.003900	.000867	....	....	
13, 250	53, 000	.004333	.000433	....	....	
13, 500	54, 000	.005600	.001267	....	....	
13, 750	55, 000	.006400	.000800	....	....	
14, 000	56, 000	.007233	.000833	....	....	
14, 250	57, 000	.008000	.000767	....	....	
14, 500	58, 000	.008900	.000900	....	....	
14, 750	59, 000	.009733	.000833	....	....	
15, 000	60, 000	.010567	.000834	....	....	
15, 500	62, 000	.012467	.001900	....	....	
16, 000	64, 000	.014333	.001866	....	....	
16, 500	66, 000	.016167	.001834	....	....	
17, 000	68, 000	.018000	.001833	....	....	
17, 500	70, 000	.020000	.002000	....	....	
18, 000	72, 000	.022333	.002333	....	....	
18, 500	74, 000	.024833	.002500	....	....	
19, 000	76, 000	.027167	.002334	....	....	
19, 500	78, 000	.030000	.002833	....	....	
20, 000	80, 000	.033000	.003000	....	....	
20, 500	82, 000	.037000	.004000	....	....	
21, 000	84, 000	.040667	.003667	....	....	
21, 500	86, 000	.045000	.004333	....	....	
22, 000	88, 000	.0500	.0050	....	....	
22, 500	90, 000	.0567	.0067	....	....	
23, 000	92, 000	.0667	.0100	....	....	
23, 500	94, 000	.0833	.0166	....	....	
24, 000	96, 000	.1100	.0267	....	....	
24, 010	96, 040	.1267	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 96, 040
Elastic limit per square inch of original section....................................do.... 48, 000
Elongation per inch after rupture....................................inch.. 0.1600
Elongation per inch under strain at elastic limit....................................do.... .001800
Reduction in diameter at point of rupture....................................do.... .114
Reduction in area after rupture, per centum of original section.................................... 36.
Position of rupture.................................... 1″ from neck
Character of broken surface....................................silky, 50 per cent.; granular, 50 per cent.
Elongation of inch sections....................................″.09, ″.17, ″.3

BUSHING RING.

Exterior diameter, 20″.5.
Interior diameter, 13″.

No. 3360.

Marks, $^{10\,B_1\,Bn}_{\;\;T_1\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000533	.000200	0.		
5,000	20,000	.000667	.000134	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167	0.		
10,000	40,000	.001333	.000166	.000033	.000033	
11,250	45,000	.001533	.000200			
12,500	50,000	.001700	.000167			
12,750	51,000	.001767	.000067			Elastic limit.
13,000	52,000	.001900	.000133			
13,250	53,000	.001967	.000067			
13,500	54,000	.002167	.000200			
13,750	55,000	.002433	.000266			
14,000	56,000	.002967	.000534			
14,250	57,000	.003467	.000500			
14,500	58,000	.004267	.000800			
14,750	59,000	.004900	.000633			
15,000	60,000	.005600	.000700			
15,500	62,000	.006900	.001300			
16,000	64,000	.008167	.001267			
16,500	66,000	.009500	.001333			
17,000	68,000	.011000	.001500			
17,500	70,000	.012267	.001267			
18,000	72,000	.013567	.001300			
18,500	74,000	.015000	.001433			
19,000	76,000	.016467	.001467			
19,500	78,000	.018033	.001566			
20,000	80,000	.019833	.001800			
20,500	82,000	.021500	.001667			
21,000	84,000	.023333	.001833			
21,500	86,000	.025600	.002267			
22,000	88,000	.027600	.002000			
22,500	90,000	.030133	.002533			
23,000	92,000	.032733	.002600			
23,500	94,000	.035833	.003100			
24,000	96,000	.039333	.003500			
24,500	98,000	.041667	.002334			
25,000	100,000	.0467	.005033			
25,500	102,000	.0533	.0066			
26,000	104,000	.0633	.0100			
26,500	106,000	.0733	.0100			
26,920	107,680	.1100	.0367			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	107,680
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1400
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		1″.25 from neck
Character of broken surface		granular; silky spot near the circumference
Elongation of inch sections		″.16, ″.17*, ″.09

No. 3361.

Marks, $^{10}\frac{B_1\,Bu}{T_2\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

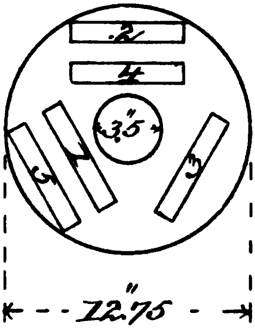
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001600	.000167	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001767	.000034	....	....	Elastic limit.
14,000	56,000	.001867	.000100	....	....	
14,250	57,000	.002000	.000133	....	....	
14,500	58,000	.002267	.000267	....	....	
14,750	59,000	.002667	.000400	....	....	
15,000	60,000	.003467	.000800	....	....	
15,500	62,000	005033	.001566	....	....	
16,000	64,000	.006367	.001334	....	....	
16,500	66,000	.007833	.001466	....	....	
17,000	68,000	.009100	.001267	....	....	
17,500	70,000	.010500	.001400	....	....	
18,000	72,000	.011867	.001367	....	....	
18,500	74,000	.013333	.001466	....	....	
19,000	76,000	.014833	.001500	....	....	
19,500	78,000	.016400	.001567	....	....	
20,000	80,000	.018167	.001767	....	....	
20,500	82,000	.019733	.001566	....	....	
21,000	84,000	.021833	.002100	....	....	
31,500	86,000	.023767	.001934	....	....	
22,000	88,000	.026167	.002400	....	....	
22,500	90,000	.028400	.002233	....	....	
23,000	92,000	.030667	.002267	....	....	
23,500	94,000	.033500	.002833	....	....	
24,000	96,000	.036833	.003333	....	....	
24,500	98,000	.041667	.004834	....	....	
25,000	100,000	.0467	.005033	....	....	
25,500	102,000	.0533	.0066	....	....	
26,000	104,000	.0600	.0067	....	....	
26,500	106,000	.0700	.0100	....	....	
27,000	108,000	.0933	.0233	....	....	
27,120	108,480	.1100	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,480
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do	.001767
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.15 from neck
Character of broken surface		silky center; granular at circumference
Elongation of inch sections		″.26*, ″.19, ″.12

10 inch Steel B. L. Rifle

Gas check ring



H Ex No 16 50, 1.

GAS-CHECK RING.

No. 2843.

Marks, 10 R_1 G R T_1 I
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001100	.000133	....	....	
10, 000	40, 000	.001267	.000167	....	....	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001433	.000066	....	....	
11, 250	45, 000	.001500	.000067	....	....	
11, 500	46, 000	.001533	.000033	....	....	
11, 750	47, 000	.001567	.000034	....	....	
12, 000	48, 000	.001600	.000033	....	....	Elastic limit.
12, 250	49, 000	.001767	.000167	....	....	
12, 500	50, 000	.002900	.001133	....	....	
12, 750	51, 000	.003600	.000700	....	....	
13, 000	52, 000	.004267	.000667	....	....	
13, 250	53, 000	.005000	.000733	....	....	
13, 500	54, 000	.005867	.000867	....	....	
13, 750	55, 000	.006533	.000666	....	....	
14, 000	56, 000	.007400	.000867	....	....	
14, 500	58, 000	.009000	.001600	....	....	
15, 000	60, 000	.010833	.001833	....	....	
15, 500	62, 000	.012500	.001667	....	....	
16, 000	64, 000	.014133	.001633	....	....	
16, 500	66, 000	.016333	.002200	....	....	
17, 000	68, 000	.018333	.002000	....	....	
17, 500	70, 000	.020333	.002000	....	....	
18, 000	72, 000	.022667	.002334	....	....	
18, 500	74, 000	.025167	.002500	....	....	
19, 000	76, 000	.027700	.002533	....	....	
19, 500	78, 000	.030100	.002700	....	....	
20, 000	80, 000	.033733	.003333	....	....	
20, 500	82, 000	.037233	.003500	....	....	
21, 000	84, 000	.041333	.004100	....	....	
21, 500	86, 000	.045667	.004334	....	....	
22, 000	88, 000	.0533	.007633	....	....	
22, 500	90, 000	.0633	.0100	....	....	
23, 000	92, 000	.0700	.0067	....	....	
23, 500	94, 000	.0867	.0167	....	....	
23, 940	95, 760	.1333	.0466	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	95, 760
Elastic limit per square inch of original section	do ...	48, 000
Elongation per inch after rupture	inch..	0. 2000
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		1″.47 from neck
Character of broken surface		silky
Elongation of inch sections		″.17, ″.31*, .12

No. 2844.

Marks, $^{10}\frac{R_1 G R}{T_2 O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001100	.000133	....	....	
10,000	40,000	.001267	.000167	....	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001433	.000066	....	....	
11,250	45,000	.001467	.000034	....	....	
11,500	46,000	.001500	.000033	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001633	.000033	....	....	
12,750	51,000	.001700	.000067	....	....	
13,000	52,000	.001767	.000067	....	....	Elastic limit.
13,250	53,000	.002867	.001100	....	....	
13,500	54,000	.003467	.000600	....	....	
13,750	55,000	.004300	.000833	....	....	
14,000	56,000	.005133	.000833	....	....	
14,250	57,000	.005733	.000600	....	....	
14,500	58,000	.006633	.000900	....	....	
14,750	59,000	.007333	.000700	....	....	
15,000	60,000	.008167	.000834	....	....	
15,500	62,000	.009867	.001700	....	....	
16,000	64,000	.011500	.001633	....	....	
16,500	66,000	.013333	.001833	....	....	
17,000	68,000	.015000	.001667	....	....	
17,500	70,000	.017667	.002667	....	....	
18,000	72,000	.019500	.001833	....	....	
18,500	74,000	.021000	.001500	....	....	
19,000	76,000	.023167	.002167	....	....	
19,500	78,000	.025600	.002433	....	....	
20,000	80,000	.027900	.002300	....	....	
20,500	82,000	.030700	.002800	....	....	
21,000	84,000	.034500	.003800	....	....	
21,500	86,000	.038333	.003833	....	....	
22,000	88,000	.041833	.003500	....	....	
22,500	90,000	.045933	.004100	....	....	
23,000	92,000	.0533	.007367	....	....	
23,500	94,000	.0600	.0067	....	....	
24,000	96,000	.0700	.0100	....	....	
24,500	98,000	.0867	.0167	....	....	
24,800	99,200	.1233	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	99,200
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.223
Elongation per inch under strain at elastic limit	do....	[illegible]
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		39.[illegible]
Position of rupture		1″.7 from neck
Character of broken surface		silky
Elongation of inch sections		″.18, ″.25*, ″.13

No. 2845.

Marks, $^{10}{R_1\ G\ R \atop T_2\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
10,000	40,000	.001300	.000167	....	....	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001400	.000067	....	....	
10,750	43,000	.001467	.000067	....	....	
11,000	44,000	.001533	.000066	....	....	
11,250	45,000	.001567	.000034	....	....	
11,500	46,000	.001600	.000033	....	....	
11,750	47,000	.001633	.000033	....	....	
12,000	48,000	.001633	0.	....	....	
12,250	49,000	.001667	.000034	....	....	Elastic limit
12,500	50,000	.001767	.000100	....	....	
12,750	51,000	.001933	.000166	....	....	
13,000	52,000	.002733	.000800	....	....	
13,250	53,000	.003333	.000600	....	....	
13,500	54,000	.004067	.000734	....	....	
13,750	55,000	.004767	.000700	....	....	
14,000	56,000	.005567	.000800	....	....	
14,250	57,000	.006067	.000500	....	....	
14,500	58,000	.006967	.000900	....	....	
14,750	59,000	.007767	.000800	....	....	
15,000	60,000	.008567	.000800	....	....	
15,500	62,000	.010233	.001666	....	....	
16,000	64,000	.011833	.001600	....	....	
16,500	66,000	.014400	.002567	....	....	
17,000	68,000	.015733	.001333	....	....	
17,500	70,000	.017267	.001534	....	....	
18,000	72,000	.019467	.002200	....	....	
18,500	74,000	.021500	.002033	....	....	
19,000	76,000	.023900	.002400	....	....	
19,500	78,000	.026400	.002500	....	....	
20,000	80,000	.029100	.002700	....	....	
20,500	82,000	.032233	.003133	....	....	
21,000	84,000	.035567	.003334	....	....	
21,500	86,000	.039400	.003833	....	....	
22,000	88,000	.043733	.004333	....	....	
22,500	90,000	.048667	.004934	....	....	
23,000	92,000	.0567	.008033	....	....	
23,500	94,000	.0667	.0100	....	....	
24,000	96,000	.0767	.0100	....	....	
24,500	98,000	.1000	.0233	....	....	
24,520	98,080	.1300	.0300	....	....	Tensile strength.

General summary.

Specific gravity		7.8578
Hardness		19.89
Tensile strength per square inch of original section	pounds..	98,080
Elastic limit per square inch of original section	do ...	49,000
Elongation per inch after rupture	inch..	0.1733
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.00 from neck
Character of broken surface		silky
Elongation of inch sections		″.28*, ″.17, ″.07

No. 2844.

Marks, $^{10}\frac{R_1\,G\,R}{T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001100	.000133	....	....	
10,000	40,000	.001267	.000167	....	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001433	.000066	....	....	
11,250	45,000	.001467	.000034	....	....	
11,500	46,000	.001500	.000033	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001633	.000033	....	....	
12,750	51,000	.001700	.000067	....	....	
13,000	52,000	.001767	.000067	....	....	Elastic limit.
13,250	53,000	.002867	.001100	....	....	
13,500	54,000	.003467	.000600	....	....	
13,750	55,000	.004300	.000833	....	....	
14,000	56,000	.005133	.000833	....	....	
14,250	57,000	.005733	.000600	....	....	
14,500	58,000	.006633	.000900	....	....	
14,750	59,000	.007333	.000700	....	....	
15,000	60,000	.008167	.000834	....	....	
15,500	62,000	.009867	.001700	....	....	
16,000	64,000	.011500	.001633	....	....	
16,500	66,000	.013333	.001833	....	....	
17,000	68,000	.015000	.001667	....	....	
17,500	70,000	.017667	.002667	....	....	
18,000	72,000	.019500	.001833	....	....	
18,500	74,000	.021000	.001500	....	....	
19,000	76,000	.023167	.002167	....	....	
19,500	78,000	.025600	.002433	....	....	
20,000	80,000	.027900	.002300	....	....	
20,500	82,000	.030700	.002800	....	....	
21,000	84,000	.034500	.003800	....	....	
21,500	86,000	.038333	.003833	....	....	
22,000	88,000	.041833	.003500	....	....	
22,500	90,000	.045933	.004100	....	....	
23,000	92,000	.0533	.007367	....	....	
23,500	94,000	.0600	.0067	....	....	
24,000	96,000	.0700	.0100	....	....	
24,500	98,000	.0867	.0167	....	....	
24,800	99,200	.1233	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	[illegible]
Elastic limit per square inch of original section	do....	[illegible]
Elongation per inch after rupture	inch..	[illegible]
Elongation per inch under strain at elastic limit	do....	[illegible]
Reduction in diameter at point of rupture	do....	[illegible]
Reduction in area after rupture, per centum of original section		[illegible]
Position of rupture		1″.7 from neck
Character of broken surface		[illegible]
Elongation of inch sections		″.12, ″.35, [illegible]

No. 2896.

Marks, $^{10}\begin{matrix}R_1\ G\ R\\T_5\ O\end{matrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000883	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001667	0.	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001767	.000067	....	....	
13,500	54,000	001833	.000066	....	....	
13,750	55,000	.001900	.000067	....	....	
14,000	56,000	.001933	.000033	....	....	Elastic limit.
14,250	57,000	.002067	.000134	....	....	
14,500	58,000	.002367	.000300	....	....	
14,750	59,000	.002700	.000333	....	....	
15,000	60,000	.003167	.000467	....	....	
15,500	62,000	.004033	.000866	....	....	
16,000	64,000	.005267	.001234	....	....	
16,500	66,000	.006600	.001333	....	....	
17,000	68,000	.007933	.001333	....	....	
17,500	70,000	.009367	.001434	....	....	
18,000	72,000	.010833	.001466	....	....	
18,500	74,000	.012333	.001500	....	....	
19,000	76,000	.013833	.001500	....	....	
19,500	78,000	.015667	.001834	....	....	
20,000	80,000	.017233	.001566	....	....	
20,500	82,000	.019167	.001934	....	....	
21,000	84,000	.020867	.001700	....	....	
21,500	86,000	.023000	.002133	....	....	
22,000	88,000	.024933	.001933	....	....	
22,500	90,000	.027367	.002434	....	....	
23,000	92,000	.029800	.002433	....	....	
23,500	94,000	.032667	.002867	....	....	
24,000	96,000	.034833	.002166	....	....	
24,500	98,000	.038533	.002700	....	....	
25,000	100,000	.043167	.004634	....	....	
25,500	102,000	.0467	.003533	....	....	
26,000	104,000	.0567	.0100	....	....	
26,500	106,000	.0633	.0066	....	....	
27,000	108,000	.0733	.0100	....	....	
27,290	109,160	.1000	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	109,160
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch	0.1367
Elongation per inch under strain at elastic limit	do	.001933
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1″.60 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.08, ″.25*, ″08

No. 2895.

Marks, $^{10}\frac{R_1\ G\ R}{T_4\ I}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001433	.000133	....	....	
12, 500	50, 000	.001633	.000200	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001733	.000033	....	....	
13, 500	54, 000	.001767	.000034	....	....	
13, 750	55, 000	.001800	.000033	....	....	
14, 000	56, 000	.001867	.000067	....	....	
14, 250	57, 000	.001933	.000066	....	....	
14, 500	58, 000	.001967	.000034	....	....	
14, 750	59, 000	.002033	.000066	....	....	
15, 000	60, 000	.002067	.000034	....	....	
13, 250	61, 000	.002133	.000066	....	....	Elastic limit.
15, 500	62, 000	.002333	.000200	....	....	
15, 750	63, 000	.002500	.000167	....	....	
16, 000	64, 000	.002767	.000267	....	....	
16, 250	65, 000	.003067	.000300	....	....	
16, 500	66, 000	.003667	.000600	....	....	
17, 000	68, 000	.005000	.001333	....	....	
17, 500	70, 000	.006467	.001467	....	....	
18, 000	72, 000	.008033	.001566	....	....	
18, 500	74, 000	.009667	.001634	....	....	
19, 000	76, 000	.011367	.001700	....	....	
19, 500	78, 000	.013000	.001633	....	....	
20, 000	80, 000	.014700	.001700	....	....	
20, 500	82, 000	.016533	.001833	....	....	
21, 000	84, 000	.018233	.001700	....	....	
21, 500	86, 000	.020433	.002200	....	....	
22, 000	88, 000	.022600	.002167	....	....	
22, 500	90, 000	.024833	.002233	....	....	
23, 000	92, 000	.027067	.002234	....	....	
23, 500	94, 000	.029733	.002666	....	....	
24, 000	96, 000	.032700	.002967	....	....	
24, 500	98, 000	.036000	.003300	....	....	
25, 000	100, 000	.039333	.003333	....	....	
25, 500	102, 000	.042900	.003567	....	....	
26, 000	104, 000	.047500	.004600	....	....	
26, 500	106, 000	.0567	.0092	....	....	
27, 000	108, 000	.0633	.0066	....	....	
27, 500	110, 000	.0800	.0167	....	....	
27, 670	110, 680	.1000	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds .. 110,680
Elastic limit per square inch of original section .... do.... 61,000
Elongation per inch after rupture .... inch.. 0.150
Elongation per inch under strain at elastic limit .... do .. .002133
Reduction in diameter at point of rupture .... do.... [illegible]
Reduction in area after rupture, per centum of original section .... [illegible]
Position of rupture .... 1″.35 from neck
Character of broken surface .... granular; silky center
Elongation of inch sections .... ″.10, ″.22, ″.1

No. 2959.

Marks, $^{10}\mathrm{R}\tfrac{1}{2}\mathrm{F\,P}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000833	.000200	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001200	.000200	....	....	
10,000	40,000	.001367	.000167	....	....	
11,250	45,000	.001533	.000166	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001767	.000067	....	....	Elastic limit.
13,000	52,000	.001900	.000133	....	....	
13,250	53,000	.002067	.000167	....	....	
13,500	54,000	.002467	.000400	....	....	
13,750	55,000	.002833	.000366	....	....	
14,000	56,000	.003333	.000500	....	....	
14,250	57,000	.003733	.000400	....	....	
14,500	58,000	.004467	.000734	....	....	
14,750	59,000	.005600	.000533	....	....	
15,000	60,000	.005767	.000767	....	....	
15,500	62,000	.007333	.001566	....	....	
16,000	64,000	.008667	.001334	....	....	
16,500	66,000	.010000	.001333	....	....	
17,000	68,000	.011400	.001400	....	....	
17,500	70,000	.013033	.001633	....	....	
18,000	72,000	.014667	.001634	....	....	
18,500	74,000	.016333	.001666	....	....	
19,000	76,000	.018000	.001667	....	....	
19,500	78,000	.019867	.001867	....	....	
20,000	80,000	.021667	.001800	....	....	
20,500	82,000	.023733	.002066	....	....	
21,000	84,000	.026000	.002267	....	....	
21,500	86,000	.028333	.002333	....	....	
22,000	88,000	.031033	.002700	....	....	
22,500	90,000	.033667	.002634	....	....	
23,000	92,000	.036667	.003000	....	....	
23,500	94,000	.040000	.003333	....	....	
24,000	96,000	.0433	.0033	....	....	
24,500	98,000	.0467	.0034	....	....	
25,000	100,000	.0567	.0100	....	....	
25,500	102,000	.0633	.0066	....	....	
26,000	104,000	.0767	.0134	....	....	
26,380	105,520	.1067	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 105,520
Elastic limit per square inch of original section....................do.... 51,000
Elongation per inch after rupture ....inch.. 0.1533
Elongation per inch under strain at elastic limit ....do .... .001767
Reduction in diameter at point of rupture ....do ... .094
Reduction in area after rupture, per centum of original section 30.6
Position of rupture ....1″.12 from neck
Character of broken surface.................... granular; silky center
Elongation of inch sections....................″.19* ″.17, ″.10

SPINDLE FORGING.

Diameter, 12".5.

No. 3199.

Marks, $^{10}\frac{\text{R, S P}}{\text{T, I}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	....	....	
2,500	10,000	.000333	.000166	....	....	
3,750	15,000	.000500	.000167	....	....	
5,000	20,000	.000667	.000167	....	....	
6,250	25,000	.000833	.000166	....	....	
7,500	30,000	.001000	.000167	....	....	
8,750	35,000	.001167	.000167	....	....	
10,000	40,000	.001333	.000166	....	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001733	.000066	....	....	Elastic limit.
13,000	52,000	.002600	.000867	....	....	
13,250	53,000	.004867	.002267	....	....	
13,500	54,000	.006000	.001133	....	....	
13,750	55,000	.006900	.000900	....	....	
14,000	56,000	.007900	.001000	....	....	
14,250	57,000	.008567	.000667	....	....	
14,500	58,000	.009533	.000966	....	....	
14,750	59,000	.010333	.000800	....	....	
15,000	60,000	.011333	.001000	....	....	
15,500	62,000	.013333	.002000	....	....	
16,000	64,000	.015233	.001900	....	....	
16,500	66,000	.017500	.002267	....	....	
17,000	68,000	.019567	.002067	....	....	
17,500	70,000	.021833	.002266	....	....	
18,000	72,000	.024500	.002667	....	....	
18,500	74,000	.026867	.002367	....	....	
19,000	76,000	.029833	.002966	....	....	
19,500	78,000	.032833	.003000	....	....	
20,000	80,000	.036467	.003634	....	....	
20,500	82,000	.040567	.004100	....	....	
21,000	84,000	.045467	.004900	....	....	
21,500	86,000	.0500	.004533	....	....	
22,000	88,000	.0567	.0067	....	....	
22,500	90,000	.0667	.0100	....	....	
23,000	92,000	.0767	.0100	....	....	
23,500	94,000	.1033	.0266	....	....	
23,600	94,400	.1267	.0234	....	....	Tensile strength.

General summary.

Specific gravity 7.86
Hardness 18.5
Tensile strength per square inch of original section ....pounds.. 94,4
Elastic limit per square inch of original section ....do.... 51,0
Elongation per inch after rupture ....inch.. 0.16
Elongation per inch under strain at elastic limit ....do.... .0017
Reduction in diameter at point of rupture ....do.... .08
Reduction in area after rupture, per centum of original section 27.6
Position of rupture .... 1".32 from neck
Character of broken surface..granular, radiating from a dull spot at the circumference. Opened cracks in surface of stem.
Elongation of inch sections .... ".12, ".24, ".1

No. 3200.

Marks, $^{10}\genfrac{}{}{0pt}{}{E_1\,S\,P}{T_1\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.006133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001807	.000100	....	....	
13,750	55,000	.001900	.000033	....	....	Elastic limit.
14,000	56,000	.002000	.000100	....	....	
14,250	57,000	.002133	.000133	....	....	
14,500	58,000	.004033	.001900	....	....	
14,750	59,000	.004900	.000867	....	....	
15,000	60,000	.006167	.001267	....	....	
15,500	62,000	.007567	.001400	....	....	
16,000	64,000	.009733	.002166	....	....	
16,500	66,000	.011333	.001600	....	....	
17,000	68,000	.013333	.002000	....	....	
17,500	70,000	.015233	.001900	....	....	
18,000	72,000	.017333	.002100	....	....	
18,500	74,000	.019167	.001834	....	....	
19,000	76,000	.021200	.002033	....	....	
19,500	78,000	.023567	.002367	....	....	
20,000	80,000	.026033	.002466	....	....	
20,500	82,000	.028700	.002667	....	....	
21,000	84,000	.031500	.002800	....	....	
21,500	86,000	.034667	.003167	....	....	
22,000	88,000	.038667	.004000	....	....	
22,500	90,000	.042500	.003833	....	....	
23,000	92,000	.0467	.0042	....	....	
23,500	94,000	.0533	.0066	....	....	
24,000	96,000	.0600	.0067	....	....	
24,500	98,000	.0700	.0100	....	....	
25,000	100,000	.0967	.0267	....	....	
25,150	100,600	.1200	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,600
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		″.75 from neck

Character of broken surface..granular, radiating from a dull spot at the circumference. Opened cracks in surface of stem.

Elongation of inch sections .... ″11, ″.15, ″.14*

No. 3201.

Marks, $^{10}\mathrm{R}_1\mathrm{S\,P}_{\mathrm{T}_2\mathrm{M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000167	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35.000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001500	.000200	....	....	
12,500	50,000	.001767	.000267	....	....	
12,750	51,000	.001833	.000066	....	....	Elastic limit.
13,000	52,000	.002667	.000834	....	....	
13,250	53,000	.003900	.001233	....	....	
13,500	54,000	.005167	.001267	....	....	
13,750	55,000	.006000	.000833	....	....	
14,000	56,000	.007400	.001400	....	....	
14,250	57,000	.008000	.000600	....	....	
14,500	58,000	.008367	.000367	....	....	
14,750	59,000	.009333	.000966	....	....	
15,000	60,000	.010333	.001000	....	....	
15,500	62,000	.012000	.001667	....	....	
16,000	64,000	.014167	.002167	....	....	
16,500	66,000	.016000	.001833	....	....	
17,000	68,000	.018167	.002167	....	....	
17,500	70,000	.020333	.002166	....	....	
18,000	72,000	.022700	.002367	....	....	
18,500	74,000	.025167	.002467	....	....	
19,000	76,000	.027667	.002500	....	....	
19,500	78,000	.030667	.003000	....	....	
20,000	80,000	.034500	.003833	....	....	
20,500	82,000	.037667	.003167	....	....	
21,000	84,000	.041567	.003900	....	....	
21,500	86,000	.046500	.004933	....	....	
22,000	88,000	.0533	.0068	....	....	
22,500	90,000	.0600	.0067	....	....	
23,000	92,000	.0700	.0100	....	....	
23,500	94,000	.0833	.0133	....	....	
23,920	95,680	.1367	.0534	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 95,680
Elastic limit per square inch of original section..do ... 51,000
Elongation per inch after rupture ....inch.. 0.1833
Elongation per inch under strain at elastic limit ....do ... .001833
Reduction in diameter at point of rupture............ ....do.... .134
Reduction in area after rupture, per centum of original section.. 41.9
Position of rupture .. ..1" from neck
Character of broken surface..silky, 60 per cent.; granular, 40 per cent. Opened cracks in surface of stem.
Elongation of inch sections..".26*, ".17, ".12

NEW SPINDLE FORGING.

No. 3241.

Marks, $^{10}\substack{R_1\ S\ P \\ T_4\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000833	.000200	0.	....	
7,500	30,000	.000967	.000134	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001500	.000200	....	....	
12,500	50,000	.001733	.000233	....	....	
12,750	51,000	.001800	.000067	....	....	
13,000	52,000	.001867	.000067	....	....	Elastic limit.
13,250	53,000	.001967	.000100	....	....	
13,500	54,000	.003000	.001033	....	....	
13,750	55,000	.004000	.001000	....	....	
14,000	56,000	.005000	.001000	....	....	
14,250	57,000	.005667	.000667	....	....	
14,500	58,000	.006367	.000700	....	....	
14,750	59,000	.007000	.000633	....	....	
15,000	60,000	.007900	.000900	....	....	
15,500	62,000	.009700	.001800	....	....	
16,000	64,000	.011333	.001633	....	....	
16,500	66,000	.012667	.001334	....	....	
17,000	68,000	.014333	.001666	....	....	
17,500	70,000	.016667	.002334	....	....	
18,000	72,000	.018667	.002000	....	....	
18,500	74,000	.019667	.001000	....	....	
19,000	76,000	.021333	.001666	....	....	
19,500	78,000	.023733	.002400	....	....	
20,000	80,000	.026333	.002600	....	....	
20,500	82,000	.029000	.002667	....	....	
21,000	84,000	.031400	.002400	....	....	
21,500	86,000	.034667	.003267	....	....	
22,000	88,000	.037833	.003166	....	....	
22,500	90,000	.041167	.003334	....	....	
23,000	92,000	.0467	.005533	....	....	
23,500	94,000	.0500	.0033	....	....	
24,000	96,000	.0567	.0067	....	....	
24,500	98,000	.0667	.0100	....	....	
25,000	100,000	.0800	.0133	....	....	
25,460	101,840	.1233	.0433	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 101,840
Elastic limit per square inch of original section ....do.... 52,000
Elongation per inch after rupture ....inch.. 0.1867
Elongation per inch under strain at elastic limit ....do.... .001867
Reduction in diameter at point of rupture ....do.... .124
Reduction in area after rupture, per centum of original section.................... 39.2
Position of rupture ....1″.50 from neck
Character of broken surface....................................silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections ....″.13, ″.30*, ″.13

No. 3242.

Marks, $^{10}\frac{B_1\,S\,P}{T_3\,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001733	.000233	....	....	
12,750	51,000	.001767	.000034	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001933	.000033	....	....	
14,250	57,000	.001967	.000034	....	....	Elastic limit.
14,500	58,000	.002067	.000100	....	....	
14,750	59,000	.002133	.000066	....	....	
15,000	60,000	.002233	.000100	....	....	
15,250	61,000	.003267	.001034	....	....	
15,500	62,000	.004400	.001133	....	....	
15,750	63,000	.005000	.000600	....	....	
16,000	64,000	.005833	.000833	....	....	
16,500	66,000	.007833	.002000	....	....	
17,000	68,000	.009267	.001434	....	....	
17,500	70,000	.010567	.001300	....	....	
18,000	72,000	.012067	.001500	....	....	
18,500	74,000	.013667	.001600	....	....	
19,000	76,000	.015200	.001533	....	....	
19,500	78,000	.017000	.001800	....	....	
20,000	80,000	.018667	.001667	....	....	
20,500	82,000	.020567	.001900	....	....	
21,000	84,000	.022667	.002100	....	....	
21,500	86,000	.024833	.002166	....	....	
22,000	88,000	.027167	.002334	....	....	
22,500	90,000	.029500	.002333	....	....	
23,000	92,000	.032367	.002867	....	....	
23,500	94,000	.035500	.003133	....	....	
24,000	96,000	.039000	.003500	....	....	
24,500	98,000	.044000	.005000	....	....	
25,000	100,000	.047667	.003667	....	....	
25,500	102,000	.0567	.009033	....	....	
26,000	104,000	.0633	.0066	....	....	
26,500	106,000	.0700	.0067	....	....	
27,000	108,000	.1033	.0333	....	....	
27,020	108,080	.1167	.0134	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,080
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1".20 from neck
Character of broken surface		silky
Elongation of inch sections		".25*, ".22, ".10

No. 3243.

Marks, $^{10\,R_1\,S\,P}_{\quad T_6\,M}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000700	.000200	0.	....	
6,250	25,000	.000833	.000133	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001700	.000200	....	....	
12,750	51,000	.001767	.000067	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001867	.000067	....	....	
13,500	54,000	.001900	.000033	....	....	
13,750	55,000	.001933	.000033	....	....	
14,000	56,000	.002000	.000067	....	....	Elastic limit.
14,250	57,000	.002100	.000100	....	....	
14,500	58,000	.002200	.000100	....	....	
14,750	59,000	.002300	.000100	....	....	
15,000	60,000	.004333	.002033	....	....	
15,500	62,000	.005500	.001167	....	....	
16,000	64,000	.006833	.001333	....	....	
16,500	66,000	.008400	.001567	....	....	
17,000	68,000	.009667	.001267	....	....	
17,500	70,000	.011333	.001666	....	....	
18,000	72,000	.012667	.001334	....	....	
18,500	74,000	.014067	.001400	....	....	
19,000	76,000	.015667	.001600	....	....	
19,500	78,000	.017333	.001666	....	....	
20,000	80,000	.019000	.001667	....	....	
20,500	82,000	.020900	.001900	....	....	
21,000	84,000	.023000	.002100	....	....	
21,500	86,000	.025067	.002067	....	....	
22,000	88,000	.027333	.002266	....	....	
22,500	90,000	.029833	.002500	....	....	
23,000	92,000	.032667	.002834	....	....	
23,500	94,000	.035833	.003166	....	....	
24,000	96,000	.039667	.003834	....	....	
24,500	98,000	.043333	.003666	....	....	
25,000	100,000	.048333	.005000	....	....	
25,500	102,000	.0533	.004967	....	....	
26,000	104,000	.0633	.0100	....	....	
26,500	106,000	.0733	.0100	....	....	
27,000	108,000	.1067	.0334	....	....	
27,020	108,080	.1300	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,080
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1".35 from neck
Character of broken surface		silky
Elongation of inch sections		".16,".30*,".14

SECURING-PIN FORGING.

No. 2943.

Marks, 10 B, F B L
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000050	.000050	0.		
2,000	10,000	.000150	.000100	0.		
3,000	15,000	.000300	.000150	0.		
4,000	20,000	.000450	.000150	0.		
5,000	25,000	.000600	.000150	0.		
6,000	30,000	.000750	.000150	0.		
7,000	35,000	.000850	.000100	0.		
8,000	40,000	.001100	.000150	0.		
9,000	45,000	.001350	.000250			
10,000	50,000	.001500	.000150			
11,000	55,000	.001700	.000200			
11,200	56,000	.001750	.000050			
11,400	57,000	.001800	.000050			
11,600	58,000	.001850	.000050			
11,800	59,000	.001850	0.			
12,000	60,000	.001900	.000050			
12,200	61,000	.001950	.000050			Elastic limit.
12,400	62,000	.002350	.000400			
12,600	63,000	.003100	.000750			
12,800	64,000	.003750	.000650			
13,000	65,000	.004550	.000800			
13,200	66,000	.005250	.000700			
13,400	67,000	.006050	.000800			
13,600	68,000	.006800	.000750			
13,800	69,000	.007500	.000700			
14,000	70,000	.008900	.001400			
14,200	71,000	.009550	.000650			
14,400	72,000	.010000	.000450			
14,600	73,000	.011000	.001000			
14,800	74,000	.011900	.000900			
15,000	75,000	.013000	.001100			
15,200	76,000	.014100	.001100			
15,600	78,000	.015700	.001600			
16,000	80,000	.017500	.001800			
16,400	82,000	.020050	.002550			
16,800	84,000	.022000	.001950			
17,200	86,000	.024000	.002000			
17,600	88 000	.027000	.003000			
18,000	90,000	.029050	.002050			
18,400	92,000	.032000	.002950			
18,800	94,000	.035250	.003250			
19,200	96,000	.039100	.003850			
19,600	98,000	.043400	.004300			
20,000	100,000	.048500	.005100			
20,400	102,000	.0525	.0040			
20,800	104,000	.0600	.0075			
21,200	106,000	.0800	.0200			
21,600	108,000	.1050	.0250			
21,700	108,500	.1500	.0450			Tensile strength.

General summary.

Specific gravity		7.8398
Tensile strength per square inch of original section	pounds	108,500
Elastic limit per square inch of original section	do	61,000
Elongation per inch after rupture	inch	0.2200
Elongation per inch under strain at elastic limit	do	.001950
Reduction in diameter at point of rupture	do	.135
Reduction in area after rupture, per centum of original section		46.2
Position of rupture		1″.15 from neck
Character of broken surface		silky; granular at circumference
Elongation of inch sections		″.27*, ″.17

No. 2944.

Marks, $^{10}\mathrm{R}^{\mathrm{F\,B}}_{\mathrm{L}_s}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000050	.000050	0.	....	
2,000	10,000	.000150	.000100	0.	....	
3,000	15,000	.000400	.000250	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000700	.000150	0.	....	
6,000	30,000	.000950	.000250	0.	....	
7,000	35,000	.001150	.000200	0.	....	
8,000	40,000	.001350	.000200	0.	....	
9,000	45,000	.001500	.000150	0.	....	
10,000	50,000	.001650	.000150	0.	....	
11,000	55,000	.001900	.000250	....	....	
11,200	56,000	.001950	.000050	....	....	
11,400	57,000	.002000	.000050	....	....	
11,600	58,000	.002050	.000050	....	....	
11,800	59,000	.002050	0.	....	....	
12,000	60,000	.002100	.000050	....	....	
12,200	61,000	.002150	.000050	....	....	Elastic limit.
12,400	62,000	.003900	.001750	....	....	
12,600	63,000	.004100	.000200	....	....	
12,800	64,000	.004750	.000650	....	....	
13,000	65,000	.005600	.000850	....	....	
13,200	66,000	.006250	.000650	....	....	
13,400	67,000	.007100	.000850	....	....	
13,600	68,000	.007800	.000700	....	....	
13,800	69,000	.008550	.000750	....	....	
14,000	70,000	.009400	.000850	....	....	
14,200	71,000	.010250	.000850	....	....	
14,400	72,000	.011000	.000750	....	....	
14,600	73,000	.011850	.000850	....	....	
14,800	74,000	.012950	.001100	....	....	
15,200	76,000	.014400	.001450	....	....	
15,600	78,000	.016550	.002150	....	....	
16,000	80,000	.018350	.001800	....	....	
16,400	82,000	.020350	.002000	....	....	
16,800	84,000	.022650	.002300	....	....	
17,200	86,000	.024950	.002300	....	....	
17,600	88,000	.027450	.002500	....	....	
18,000	90,000	.029800	.002350	....	....	
18,400	92,000	.032800	.003000	....	....	
18,800	94,000	.035650	.002850	....	....	
19,200	96,000	.039650	.004000	....	....	
19,600	98,000	.044050	.004400	....	....	
20,000	100,000	.049300	.005250	....	....	
20,400	102,000	.0550	.0057	....	....	
20,800	104,000	.0650	.0100	....	....	
21,200	106,000	.0800	.0150	....	....	
21,600	108,000	.1100	.0300	....	....	
21,700	108,500	.1500	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,500
Elastic limit per square inch of original section	do ...	61,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.002150
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40.3
Position of rupture		1″.17 from neck
Character of broken surface		silky
Elongation of inch sections		″.19 ″.23*

HINGE-PIN FORGING.

No. 2819½.

Marks, $^{10\,\mathrm{E}_1\,\mathrm{H\,P}}_{\quad\mathrm{L}_1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000200	.000100	0.		
3,750	15,000	.000300	.000100	0.		
5,000	20,000	.000467	.000167	0.		
6,250	25,000	.000800	.000333	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001300	.000167	0.		
11,250	45,000	.001533	.000233			
12,500	50,000	.001700	.000167			
13,750	55,000	.001900	.000200			
14,000	56,000	.001933	.000033			
14,250	57,000	.001967	.000034			
14,500	58,000	.002000	.000033			
14,750	59,000	.002033	.000033			
15,000	60,000	.002067	.000034			Elastic limit.
15,250	61,000	.002200	.000133			
15,500	62,000	.002300	.000100			
15,750	63,000	.002500	.000200			
16,000	64,000	.002833	.000333			
16,250	65,000	.003100	.000267			
16,500	66,000	.003567	.000467			
16,750	67,000	.004000	.000433			
17,000	68,000	.004600	.000600			
17,250	69,000	.005233	.000633			
17,500	70,000	.005767	.000534			
18,000	72,000	.007233	.001466			
18,500	74,000	.008667	.001434			
19,000	76,000	.010167	.001500			
19,500	78,000	.011600	.001433			
20,000	80,000	.013067	.001467			
20,500	82,000	.014667	.001600			
21,000	84,000	.016233	.001566			
21,500	86,000	.018000	.001767			
22,000	88,000	.019733	.001733			
22,500	90,000	.021700	.001967			
23,000	92,000	.024033	.002333			
23,500	94,000	.025833	.001800			
24,000	96,000	.028267	.002434			
24,500	98,000	.030400	.002133			
25,000	100,000	.0333	.0029			
25,500	102,000	.0367	.0034			
26,000	104,000	.0400	.0033			
26,500	106,000	.0433	.0033			
27,000	108,000	.0467	.0034			
27,500	110,000	.0533	.0066			
28,000	112,000	.0667	.0134			
28,500	114,000	.1000	.0333			Tensile strength.

General summary.

Specific gravity		7.8574
Hardness		24.34
Tensile strength per square inch of original section	pounds	114,000
Elastic limit per square inch of original section	do	60,000
Elongation per inch after rupture	inch	0.1267
Elongation per inch under strain at elastic limit	do	.002067
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		″.63 from neck
Character of broken surface		granular; dull spot at center
Elongation of inch sections		″.36, ″.07, ″.30

TABULATION OF TENSION SPECIMENS FROM 10″ STEEL B. L. RIFLE.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per ct.*				
3446	Tube	Inside	43,000	92,480	18.7	36.4	Granular; silky center			New tube, breech end.
3447	do	Outside	47,000	92,880	18.7	41.9	do			Do.
3448	do	Middle	43,000	91,720	21.7	39.2	do	7.8691	18.38	Do.
3449	do	do	43,000	91,520	21.7	41.9	Silky; trace of granulation			Do.
3450	do	Radial	43,000	92,350	20.5	37.1	Granular; silky center			Do.
3441	do	Inside	45,000	79,520	20.7	47.2	Silky			New tube, muzzle end.
3442	do	Outside	43,000	79,440	23.7	47.2	do			Do.
3443	do	Middle	38,000	70,760	26.7	54.6	do	7.8675	10.55	Do.
3444	do	do	39,000	74,400	25.7	47.2	do			Do.
3445	do	Radial	40,000	77,450	33.0	46.2	do			Do.
3366	Jacket	Inside	37,000	86,720	20.7	39.2	do			New jacket, breech end.
3367	do	Outside	47,000	93,080	20.0	44.6	do			Do.
3368	do	Middle	39,000	88,480	18.0	41.9	do	7.8680	17.08	Do.
3369	do	do	39,000	88,800	20.7	39.2	do			Do.
3370	do	Radial	39,000	89,270	18.0	43.7	do			Do.
3377	do	Inside	50,000	91,880	20.0	49.7	do			New jacket, muzzle end.
3378	do	Middle	47,000	88,240	23.0	47.2	do	7.8642	15.59	Do.
3379	do	Outside	48,000	84,800	22.7	54.6	do			Do.
3380	do	Middle	46,000	85,960	23.7	49.7	do			Do.
3381	do	Radial	45,000	87,360	22.7	49.7	do			Do.
2811	Hoop A_1	Middle	57,000	110,040	12.7	33.5	Silky; slightly granular	7.8418	24.26	
2797	Hoop A_2	Inside	59,000	100,600	17.0	47.2	Fine silky	7.8409	20.70	
2812	Hoop A_3	Middle	54,000	102,000	15.0	44.6	Silky	7.8424	22.90	
3003	do	do	53,000	101,920	14.5	39.2	do	7.8674	21.05	New hoop.
2789	Hoop A_4	do	56,000	103,960	15.2	47.2	do	7.8438	22.14	Additional specimen.
2787	Hoop A_6	do	62,000	103,280	17.2	47.2	do	7.8402	21.89	
3005	do	Inside	56,000	103,600	10.2	21.4	Granular; silky spot	7.8407	20.81	New hoop.
3075	do	Middle	57,000	101,120	12.8	36.4	Silky; slightly granular	7.8431	21.52	Third hoop.
3166	do	do	59,000	114,800	6.8	8.4	Granular			Fifth hoop.
2829	Hoop A_7	do	59,000	111,360	11.3	33.5	Granular, 60 per cent.; silky center, 40 per cent.	7.8412	23.70	
2850	do	do	57,000	106,800	13.0	41.9	Silky; trace of granulation	7.8426	21.76	Additional specimen.

TABULATION OF TENSION SPECIMENS FROM 10″ STEEL B. L. RIFLE—Continued.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per ct.*				
2790	Hoop B_5	Middle	57,000	104,840	13.5	39.2	Silky	7.8409	22.90	Additional specimen.
2785	Hoop B_6	do	56,000	98,920	17.0	49.7	do	7.8424	21.64	Do.
2878	do	do	57,000	110,560	13.5	33.5	Granular, 60 per cent.; silky, 40 per cent.	7.8426	24.12	New hoop, additional specimen.
3074	do	do	54,000	104,320	13.5	39.2	Silky; partly granular			Third hoop.
2822	Hoop B_7	do	62,000	109,560	15.3	44.6	Fine silky	7.8419	21.64	
3001	Hoop C_3	do	54,000	101,160	15.8	39.2	Silky; trace of granulation	7.8381	21.17	New hoop.
3107	do	do	57,000	96,400	14.8	30.6	Silky	7.8467	18.57	Third hoop.
2962	Hoop C_4	Inside	54,000	100,000	17.7	41.9	Fine silky			Breech end.
2963	do	Outside	59,000	110,120	12.8	30.6	Silky and fine granulation			Do.
2964	do	Middle	54,000	101,200	13.8	44.6	Silky	7.8617	22.64	Do.
2971	do	do	55,000	105,360	11.2	33.5	Granular; silky spot			Do.
2965	do	Inside	60,000	111,200	10.5	30.6	Granular; dull spot			Muzzle end.
2966	do	Outside	58,000	112,400	12.0	30.6	Granular; silky spot			Do.
2967	do	Middle	56,000	106,720	10.8	18.3	Granular; dull spot	7.8533	24.26	Do.
2972	do	Outside	59,000	109,760	12.5	30.6	Granular, 80 per cent.; silky, 20 per cent.			Do.
2973	do	Middle	58,000	107,120	13.5	33.5	do			Do.
2804	Hoop C_5	Inside	65,000	116,080	10.3	30.6	Fine granular; silky spot			New hoop, breech end.
2805	do	Outside	67,000	110,760	15.3	41.9	Fine silky			Do.
2806	do	Middle	70,000	114,480	13.8	33.5	Silky	7.8507	24.98	Do.
2807	do	Inside	66,000	107,240	12.0	36.4	Silky and fine granular			New hoop, muzzle end.
2808	do	Outside	68,000	112,080	12.8	39.2	Silky			Do.
2809	do	Middle	66,000	108,560	14.5	41.9	do	7.8512	23.80	Do.
2851	Hoop C_6	Inside	67,000	116,160	13.7	44.6	Fine granular; silky center			Additional specimen.
2852	do	Outside	67,000	118,400	13.0	39.2	Silky and fine granular			Do.
2853	do	Middle	67,000	117,120	13.7	36.4	do	7.8593	26.67	Do.
2791	Hoop C_7	Inside	69,000	116,760	10.8	18.8	Granular			Breech end, additional specimen.
2792	do	Outside	54,000	108,480	11.7	30.6	Granular; silky center			Do.
2793	do	Middle	66,000	117,040	12.5	24.6	Granular; dull spot	7.8152	27.16	Do.
2861	do	Inside	70,000	115,720	16.0	36.4	Granular; silky center			Do.
2862	do	Middle	69,000	114,160	16.7	36.4	do	7.8488	24.20	Do.
2794	do	Inside	67,000	119,280	9.7	24.6	do			Muzzle end, additional specimen.

2795	do	Outside	69,000	117,920	13.5	13.0	Granular; dull spot			Do.
2796	do	Middle	69,000	119,480	11.8	21.4	do	7.8437	28.13	Do.
2953	do	Inside	72,000	116,640	13.5	41.9	Silky and granular			Do.
2954	do	Middle	73,000	113,640	17.0	41.9	Silky, trace of granulation			Do.
2955	do	do	67,000	112,820	16.7	41.9	Granular; silky center			Do.
3140	do	Inside	58,000	110,360	12.7	27.6	do			Second hoop.
3141	do	Outside	53,000	110,260	11.7	21.4	Granular; dull spot			Do.
3142	do	Middle	53,000	110,280	11.0	24.6	Granular; silky center	7.8496	24.26	Do.
3143	do	Inside	47,000	106,720	9.2	24.6	do			Do.
3144	do	Outside	48,000	105,680	12.0	30.6	do			Do.
3145	do	Middle	45,000	102,720	12.0	27.6	do	7.8491	20.81	Do.
3177	do	do	50,000	110,760	10.0	21.4	Granular; silky spot			Second hoop, additional specimen.
3178	do	Inside	55,000	118,200	7.7	21.4	Granular; silky center			Do.
3179	do	Outside	51,000	112,000	11.0	27.6	Granular; silky spot			Do.
3180	do	Middle	51,000	113,920	12.0	24.6	Granular; silky center			Do.
3371	do	Inside	50,000	100,120	13.8	21.4	Granular; dull spot			Third hoop.
3372	do	Outside	53,000	105,920	13.3	39.2	Silky			Do.
3373	do	Middle	51,000	102,240	13.0	24.6	Granular; dull spot			Do.
3374	do	Inside	55,000	109,920	16.3	44.6	Silky			Do.
3375	do	Outside	58,000	109,840	12.0	33.5	Granular; silky spot			Do.
3376	do	Middle	53,000	108,720	12.3	41.9	Silky; trace of granulation			Do.
3395	do	Inside	66,000	118,160	11.7	39.2	Granular; dull spot			Third hoop, additional specimen.
3396	do	Outside	59,000	115,520	7.8	15.0	do			Do.
3397	do	Middle	62,000	116,960	8.5	15.0	do			Do.
2798	Hoop C_8	Inside	62,000	108,640	13.3	30.6	do			Additional specimen.
2799	do	Outside	61,000	103,520	16.0	33.5	do			Do.
2800	do	Middle	59,000	102,480	14.0	27.6	do	7.8466	23.17	Do.
2801	do	Inside	61,000	107,280	11.2	27.6	do			Do.
2802	do	Outside	60,000	109,480	14.7	30.6	Granular, 85 per cent.; silky, 15 per cent			Do.
2803	do	Middle	61,000	110,860	14.5	27.6	Granular, 80 per cent.; silky, 20 per cent	7.8441	25.13	Do.
3124	Hoop C_9	Inside	52,000	108,400	10.8	30.6	Granular; dull spot			
3125	do	Outside	50,000	105,600	12.8	21.4	do	7.8529	23.30	
3126	do	Middle	50,000	107,200	15.2	30.6	Granular; dull center			
3234	do	do	59,000	113,560	13.5	36.4	Granular; silky center			Do.
3235	do	do	59,000	113,360	13.7	36.4	do			Do.
3236	do	Inside	63,000	118,000	9.8	33.5	do			Do.
2879	Hoop D_2	Middle	60,000	109,480	11.8	18.3	Granular; dull spot	7.8362	24.54	
3004	do	Inside	61,000	109,360	7.0	11.8	Granular	7.8362	22.39	Do.
3073	do	Middle	57,000	99,520	8.8	15.0	Granular; flaky spot	7.8421	19.60	New hoop.
3122	do	do	56,000	105,280	13.5	36.4	Silky; fine granulation			New hoop, additional specimen.
2786	Hoop D_3	do	55,000	103,520	14.5	39.2	Silky; trace of granulation	7.8407	22.77	
2810	do	do	58,000	110,120	13.0	36.4	Granular, 60 per cent.; silky, 40 per cent.	7.8445	23.84	New hoop.
3002	do	Inside	59,000	103,720	15.7	41.9	Silky	7.8364	20.36	Third hoop.
2788	Hoop D_4	Middle	57,000	103,520	14.0	41.9	do	7.8392	21.52	
2830	do	do	63,000	110,720	6.8	11.8	Granular	7.8381	23.70	New hoop.

TABULATION OF TENSION SPECIMENS FROM 10″ STEEL B. L. RIFLE—Continued.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per ct.*				
2849	Hoop D_4	Middle	59,000	109,840	11.5	36.4	Granular, 60 per cent.; silky center, 40 per cent.	7.8415	23.30	New hoop, additional specimen.
3019	do	do	58,000	108,320	13.8	39.2	Granular; silky center	7.8388	23.80	Third hoop.
3108	do	do	53,000	99,840	13.7	39.2	Silky; trace of granulation	7.8499	19.60	Fourth hoop.
3123	do	do	58,000	99,600	13.0	18.3	Granular; dull spot	7.8450	19.81	Fifth hoop.
2920	Breech block	do	48,000	99,760	6.7	11.8	Granular; flaky spot	7.8532	20.47	
2936	do	Inside	48,000	102,800	8.0	11.8	do			
3163	do	do	49,000	96,960	18.7	36.4	Silky, 50 per cent.; granular, 50 per cent.			New forging.
3164	do	Outside	55,000	100,920	17.7	41.9	Silky			Do.
3165	do	Middle	48,000	96,040	18.0	36.4	Silky, 50 per cent.; granular, 50 per cent.			Do.
3360	Bushing ring	do	51,000	107,680	14.0	21.4	Granular; silky spot			
3361	do	do	55,000	108,480	19.0	39.2	Granular; silky center			
2843	Gas-check ring	Inside	48,000	95,760	20.0	41.9	Silky			
2844	do	Outside	52,000	99,200	20.3	39.2	do			
2845	do	Middle	49,000	98,080	17.3	41.9	do	7.8578	19.39	
2895	do	Inside	61,000	110,680	15.0	30.6	Granular; silky center			
2896	do	Outside	56,000	109,160	13.7	30.6	do			
2958	Face plate		52,000	105,760	13.0	27.6	do	7.8564	21.05	
2959	do		51,000	105,520	15.3	30.6	do			
3199	Spindle	Inside	51,000	94,400	13.8	27.6	Granular; dull spot	7.8563	18.57	
3200	do	Outside	55,000	100,600	13.8	15.0	do			
3201	do	Middle	51,000	95,680	18.3	41.9	Silky, 60 per cent.; granular, 40 per cent.			
3241	do	Inside	52,000	101,840	18.7	39.2	do			Do.
3242	do	Outside	57,000	108,080	19.0	44.6	Silky			Do.
3243	do	Middle	56,000	108,080	20.0	41.9	do			Do.
2943	Securing pin		61,000	108,500	22.0	46.2	Silky; granular at circumference	7.8593		
2944	do		61,000	108,500	21.0	40.3	Silky			
2819½	Hinge pin		60,000	114,000	12.7	33.5	Granular, dull spot	7.8534	24.54	

The elongations of specimens from hoops were measured in 6 inches, except Nos. 2951 and 2952 from hoop C_7, which were measured in 3 inches; all other specimens were measured in 3 inches, excepting gas-check cups and securing pin, which were measured in 2 inches.

TABULATION OF COMPRESSION SPECIMENS FROM 10″ *STEEL B. L. RIFLE.*

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Pounds.	*Pounds.*		
746	Tube	Radial	42, 000	89, 380	Triple flexure ...	New tube, breech end.
747	....do	....do	43, 000	89, 400	....do	Do.
748	....do	Inside	47, 000	84, 960	....do	Do.
749	....do	Outside.	46, 000	86, 160	....do	Do.
750	....do	Middle	40, 000	83, 700	... do	Do.
741	....do	Radial	43, 000	90, 400	....do	New tube, muzzle end.
742	....do	....do	42, 000	95, 600	....do	Do.
743	....do	Inside	45, 000	92, 800	....do	Do.
744	....do	Outside.....	47, 000	95, 160	....do	Do.
745	....do	Middle	43, 000	93, 440	....do	Do.
751	Jacket....	Radial	40, 000	84, 960	....do	New jacket, breech end.
752	....do	....do	38, 000	83, 800	....do	Do.
753	....do	Inside	54, 000	84, 600	....do	Do.
754	....do	Outside.....	47, 000	85, 840	....do	Do.
755	....do	Middle	38, 000	82, 960	....do	Do.
756	....do	Radial	48, 000	81, 360	....do	New jacket, muzzle end.
757	....do	....do	47, 000	62, 840	....do	Do.
758	...do	Inside	52, 000	83, 500	....do	Do.
759	....do	Outside.....	47, 000	81, 940	....do	Do.
760	....do	Middle	45, 000	81, 640	....do	Do.

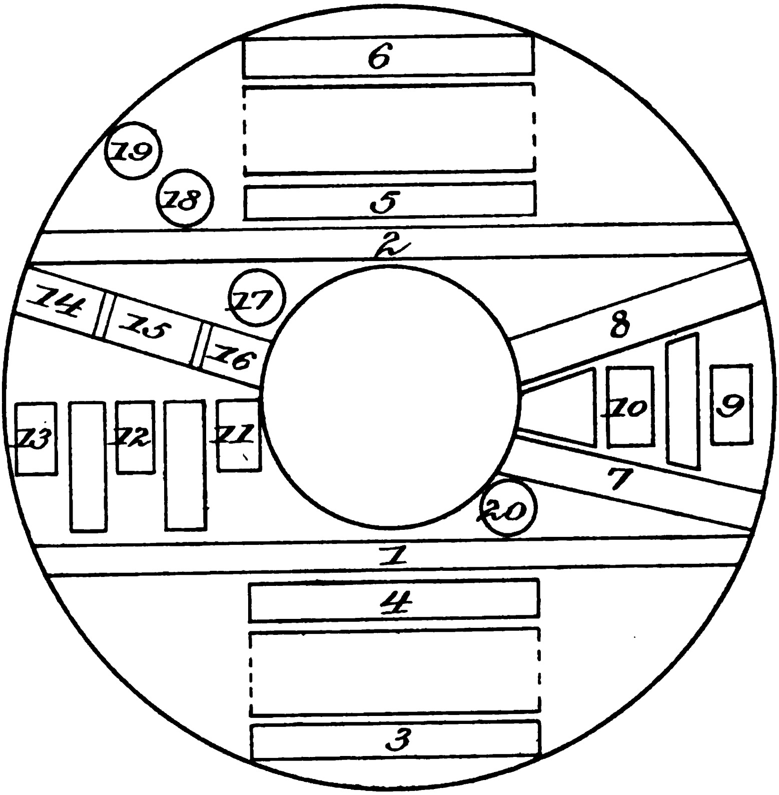
12-INCH B. L. RIFLED MORTAR.

SPECIMENS FROM CAST-IRON BODY, AND STEEL SPECIMENS FROM HOOPS, BREECH BLOCK, GAS-CHECK RING, FACE PLATE, SPINDLE, AND HINGE PIN.

12 inch B. L. Rifled Mortar

Cast iron body

Breech initial tension ring

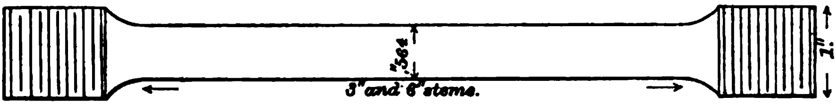


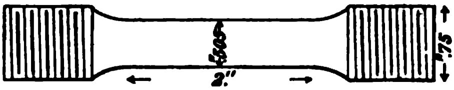
H Ex No 16 50, 1.

12-INCH B. L. RIFLED MORTAR.

DETAILS OF TESTS.

Forms of specimens.





CAST-IRON BODY—BREECH INITIAL TENSION RING.

No. 2990.

Marks, $^{12\,M\,R_1\,T\,R_2}_{\quad B\,T_1\,I}$
Diameter, 1".129.
Sectional area, 1 square inch.
Length of stem, 26".
Gauged length, 25".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000060	.000060	.000004	.000004	
3,000	3,000	.000108	.000048	.000004	0.	
4,000	4,000	.000160	.000052	.000008	.000004	
5,000	5,000	.000212	.000052	.000008	0.	
6,000	6,000	.000272	.000060	.000008	0.	
7,000	7,000	.000324	.000052	.000012	.000004	
8,000	8,000	.000384	.000060	.000020	.000008	
9,000	9,000	.000452	.000068	.000028	.000008	
10,000	10,000	.000512	.000060	.000036	.000008	
11,000	11,000	.000576	.000064	.000044	.000008	
12,000	12,000	.000652	.000076	.000056	.000012	
13,000	13,000	.000724	.000072	.000068	.000012	
14,000	14,000	.000800	.000076	.000084	.000016	
15,000	15,000	.000892	.000092	.000108	.000024	
16,000	16,000	.000980	.000088	.000132	.000024	
17,000	17,000	.001076	.000096	.000164	.000032	
18,000	18,000	.001192	.000116	.000212	.000048	
19,000	19,000	.001312	.000120	.000264	.000052	
20,000	20,000	.001456	.000144	.000324	.000060	
21,000	21,000	.001628	.000172	.000416	.000092	
22,000	22,000	.001812	.000184	.000528	.000112	
23,000	23,000	.002056	.000244	.000680	.000152	
24,000	24,000	.002352	.000296	.000880	.000200	
1,000	1,000	.000880	....	....	....	
2,000	2,000	.000932	.000052	....	....	
3,000	3,000	.000984	.000052	....	....	
4,000	4,000	.001048	.000064	....	....	
5,000	5,000	.001100	.000052	....	....	
6,000	6,000	.001160	.000060	....	....	
7,000	7,000	.001220	.000060	....	....	
8,000	8,000	.001280	.000060	....	....	
9,000	9,000	.001340	.000060	....	....	
10,000	10,000	.001400	.000060	....	....	
11,000	11,000	.001460	.000060	....	....	
12,000	12,000	.001528	.000068	....	....	
13,000	13,000	.001588	.000060	....	....	
14,000	14,000	.001656	.000068	....	....	
15,000	15,000	.001716	.000060	....	....	
16,000	16,000	.001784	.000068	....	....	
17,000	17,000	.001844	.000060	....	....	

No. 2990—Continued.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
18, 000	18, 000	.001912	.000068			
19, 000	19, 000	.001988	.000076			
20, 000	20, 000	.002052	.000064			
21, 000	21, 000	.002124	.000072			
22, 000	22, 000	.002200	.000076			
21, 000	21, 000	.002148	.000052			
20, 000	20, 000	.002092	.000056			
19, 000	19. 000	.002036	.000056			
18, 000	18, 000	.001976	.000060			
17, 000	17, 000	.001916	.000060			
16, 000	16, 000	.001856	.000060			
15, 000	15, 000	.001796	.000060			
14, 000	14, 000	.001740	.000056			
13, 000	13, 000	.001680	.000060			
12. 000	12, 000	.001616	.000064			
11, 000	11, 000	.001556	.000060			
10, 000	10, 000	.001484	.000072			
9, 000	9, 000	.001428	.000056			
8, 000	8, 000	.001368	.000060			
7, 000	7, 000	.001300	.000068			
6, 000	6, 000	.001236	.000064			
5, 000	5, 000	.001168	.000068			
4, 000	4, 000	.001092	.000076			
3, 000	3, 000	.001028	.000064			
2, 000	2, 000	.000964	.000064			
1, 000	1, 000	.000892	.000072			
25, 000	25, 000	.002708 .002800	.000356 .000092			After 4 minutes.
26, 000	26, 000					Tensile strength.

Sustained the maximum load ½ minute, during which time stretching was going on; and then fractured 2″.60 from neck. Appearance of fracture, granular, mottled.

No. 2991.

Marks, $\begin{smallmatrix}{}^{12}\mathrm{M\,R_1\,T\,R_6}\\ \mathrm{B\,T_2\,I}\end{smallmatrix}$
Diameter, 1''.129.
Sectional area, 1 square inch.
Gauged length, 25''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000042	.000042	0.	....	
3,000	3,000	.000100	.000058	0.	....	
4,000	4,000	.000160	.000060	.000008	.000008	
5,000	5,000	.000212	.000052	.000008	0.	
6,000	6,000	.000268	.000056	.000012	.000004	
7,000	7,000	.000320	.000052	.000012	0.	
8,000	8,000	.000372	.000052	.000016	.000004	
9,000	9,000	.000440	.000068	.000020	.000004	
10,000	10,000	.000508	.000068	.000028	.000008	
11,000	11,000	.000564	.000056	.000036	.000008	
12,000	12,000	.000632	.000068	.000052	.000016	
13,000	13,000	.000708	.000076	.000064	.000012	
14,000	14,000	.000768	.000060	.000080	.000016	
15,000	15,000	.000852	.000084	.000100	.000020	
16,000	16,000	.000952	.000100	.000116	.000016	
17,000	17,000	.001052	.000100	.000148	.000032	
18,000	18,000	.001168	.000116	.000200	.000052	
19,000	19,000	.001292	.000124	.000256	.000056	
20,000	20,000	.001428	.000136	.000316	.000060	
21,000	21,000	.001572	.000144	.000380	.000064	
22,000	22,000	.001752	.000180	.000492	.000112	
23,000	23,000	.001968	.000216	.000632	.000140	
24,000	24,000	.002280	.000312	.000824	.000192	
25,000	25,000	.002620	.000340	.001068	.000244	
27,780	27,780	....	....	....	....	Tensile strength.

Fractured 7½ inches from neck. Appearance, granular, mottled.

No. 710.

Marks, $^{12}\frac{M\ R_1\ T\ R_2}{B\ T_3\ O}$
Length, 12''.225.
Diameter, 1''.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050	0.	....	
3,000	3,000	.000100	.000050	0.	....	
4,000	4,000	.000150	.000050	0.	....	
5,000	5,000	.000210	.000060	.000010	.000010	
6,000	6,000	.000260	.000050	....	....	
7,000	7,000	.000310	.000050	....	....	
8,000	8,000	.000360	.000050	....	....	
9,000	9,000	.000420	.000060	....	....	
10,000	10,000	.000470	.000050	.000030	.000020	
11,000	11,000	.000530	.000060	....	....	
12,000	12,000	.000590	.000060	....	....	
13,000	13,000	.000660	.000070	....	....	
14,000	14,000	.000710	.000050	....	....	
15,000	15,000	.000770	.000060	.000070	.000040	
16,000	16,000	.000830	.000060	....	....	
17,000	17,000	.000900	.000070	....	....	
18,000	18,000	.000960	.000060	....	....	
19,000	19,000	.001020	.000060	....	....	
20,000	20,000	.001090	.000070	.000150	.000080	
21,000	21,000	.001160	.000070	....	....	
22,000	22,000	.001220	.000060	....	....	
23,000	23,000	.001290	.000070	....	....	
24,000	24,000	.001390	.000100	....	....	
25,000	25,000	.001470	.000080	.000270	.000120	
26,000	26,000	.001560	.000090	....	....	
27,000	27,000	.001660	.000100	....	....	
28,000	28,000	.001750	.000090	....	....	
29,000	29,000	.001880	.000130	....	....	
30,000	30,000	.002050	.000170	.000550	.000280	
31,000	31,000	.002190	.000140	....	....	
32,000	32,000	.002360	.000170	....	....	
33,000	33,000	.002590	.000230	....	....	
34,000	34,000	.002820	.000230	....	....	
35,000	35,000	.003160	.000340	.001370	.000820	
36,000	36,000	.003470	.000310	....	....	
37,000	37,000	.003790	.000320	....	....	
38,000	38,000	.004170	.000380	....	....	
39,000	39,000	.004640	.000470	....	....	
40,000	40,000	.005070	.000430	.002980	.001610	
54,880	54,880	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 711.

Marks, $\begin{smallmatrix}12\ \mathrm{M}\ \mathrm{R}_1\ \mathrm{T}\ \mathrm{R}_6\\ \mathrm{B}\ \mathrm{T}_4\ \mathrm{I}\end{smallmatrix}$
Length, 12″.213.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000060	.000060	0.	....	
3,000	3,000	.000110	.000050	0.	....	
4,000	4,000	.000170	.000060	0.	....	
5,000	5,000	.000220	.000050	.000010	.000010	
6,000	6,000	.000270	.000050	....	....	
7,000	7,000	.000320	.000050	....	....	
8,000	8,000	.000390	.000070	....	....	
9,000	9,000	.000450	.000060	....	....	
10,000	10,000	.000500	.000050	.000040	.000030	
11,000	11,000	.000550	.000050	....	....	
12,000	12,000	.000600	.000050	....	....	
13,000	13,000	.000650	.000050	....	....	
14,000	14,000	.000710	.000060	....	....	
15,000	15,000	.000790	.000080	.000070	.000030	
16,000	16,000	.000840	.000050	....	....	
17,000	17,000	.000900	.000060	....	....	
18,000	18,000	.000960	.000060	....	....	
19,000	19,000	.001020	.000060	....	....	
20,000	20,000	.001090	.000070	.000120	.000050	
21,000	21,000	.001160	.000070	....	....	
22,000	22,000	.001220	.000060	....	....	
23,000	23,000	.001300	.000080	....	....	
24,000	24,000	.001380	.000080	....	....	
25,000	25,000	.001470	.000090	.000240	.000120	
26,000	26,000	.001560	.000090	....	....	
27,000	27,000	.001650	.000090	....	....	
28,000	28,000	.001760	.000110	....	....	
29,000	29,000	.001860	.000100	....	....	
30,000	30,000	.002020	.000160	.000490	.000250	
31,000	31,000	.002180	.000160	....	....	
32,000	32,000	.002340	.000160	....	....	
33,000	33,000	.002520	.000180	....	....	
34,000	34,000	.002760	.000240	....	....	
35,000	35,000	.003050	.000290	.001250	.000760	
36,000	36,000	.003360	.000290	....	....	
37,000	37,000	.003600	.000240	....	....	
38,000	38,000	.004010	.000410	....	....	
39,000	39,000	.004360	.000350	....	....	
40,000	40,000	.004860	.000500	.002760	.001510	
55,650	55,650	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 712.

Marks, $\begin{matrix}{}^{12}\mathrm{M\ B_1\ T\ B_6} \\ \mathrm{B\ T_3\ I}\end{matrix}$
Length, 12″.237.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050			
3,000	3,000	.000100	.000050			
4,000	4,000	.000150	.000050			
5,000	5,000	.000200	.000050	.000010	.000010	
6,000	6,000	.000260	.000060			
7,000	7,000	.000310	.000050			
8,000	8,000	.000370	.000060			
9,000	9,000	.000420	.000050			
10,000	10,000	.000470	.000050	.000020	.000010	
11,000	11,000	.000530	.000060			
12,000	12,000	.000600	.000070			
13,000	13,000	.000660	.000060			
14,000	14,000	.000710	.000050			
15,000	15,000	.000760	.000050	.000060	.000040	
16,000	16,000	.000820	.000060			
17,000	17,000	.000890	.000070			
18,000	18,000	.000960	.000070			
19,000	19,000	.001020	.000060			
20,000	20,000	.001070	.000050	.000120	.000060	
21,000	21,000	.001130	.000060			
22,000	22,000	.001190	.000060			
23,000	23,000	.001270	.000080			
24,000	24,000	.001380	.000110			
25,000	25,000	.001460	.000080	.000230	.000110	
26,000	26,000	.001550	.000090			
27,000	27,000	.001640	.000090			
28,000	28,000	.001760	.000120			
29,000	29,000	.001860	.000100			
30,000	30,000	.002000	.000140	.000510	.000280	
31,000	31,000	.002170	.000170			
32,000	32,000	.002300	.000130			
33,000	33,000	.002510	.000210			
34,000	34,000	.002800	.000290			
35,000	35,000	.003030	.000230	.001270	.000760	
36,000	36,000	.003360	.000330			
37,000	37,000	.003650	.000290			
38,000	38,000	.003980	.000330			
39,000	39,000	.004450	.000470			
40,000	40,000	.004920	.000470	.002830	.001560	
54,980	54,980					Ultimate strength.

Failed by triple flexure.

No. 713.

Marks, $\genfrac{}{}{0pt}{}{12\,\mathrm{M\,R_1\,T\,R_2}}{\mathrm{B\,T_2\,O}}$
Length, 12''.290.
Diameter, 1''.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000040	.000040	....	....	
3,000	3,000	.000090	.000050	....	....	
4,000	4,000	.000140	.000050	....	....	
5,000	5,000	.000190	.000050	0.	....	
6,000	6,000	.000240	.000050	....	....	
7,000	7,000	.000300	.000060	....	....	
8,000	8,000	.000360	.000060	....	....	
9,000	9,000	.000410	.000050	....	....	
10,000	10,000	.000470	.000060	.000020	.000020	
11,000	11,000	.000520	.000050	....	....	
12,000	12,000	.000580	.000060	....	....	
13,000	13,000	.000630	.000050	....	....	
14,000	14,000	.000690	.000060	....	....	
15,000	15,000	.000750	.000060	.000080	.000060	
16,000	16,000	.000810	.000060	....	....	
17,000	17,000	.000860	.000050	....	....	
18,000	18,000	.000920	.000060	....	....	
19,000	19,000	.000980	.000060	....	....	
20,000	20,000	.001040	.000060	.000130	.000050	
21,000	21,000	.001120	.000080	....	....	
22,000	22,000	.001180	.000060	....	....	
23,000	23,000	.001260	.000080	....	....	
24,000	24,000	.001320	.000060	....	....	
25,000	25,000	.001420	.000100	.000230	.000100	
26,000	26,000	.001500	.000080	....	....	
27,000	27,000	.001590	.000090	....	....	
28,000	28,000	.001680	.000090	....	....	
29,000	29,000	.001820	.000140	....	....	
30,000	30,000	.001950	.000130	.000510	.000280	
31,000	31,000	.002110	.000160	....	....	
32,000	32,000	.002240	.000130	....	....	
33,000	33,000	.002440	.000200	....	....	
34,000	34,000	.002730	.000290	....	....	
35,000	35,000	.003020	.000290	.001280	.000770	
36,000	36,000	.003300	.000280	....	....	
37,000	37,000	.003630	.000330	....	....	
38,000	38,000	.003890	.000260	....	....	
39,000	39,000	.004390	.000500	....	....	
40,000	40,000	.004900	.000510	.002840	.001560	
55,000	55,000	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 714.

Marks, $\overset{12\ M\ R_1\ T\ R_6}{B\ R_7}$

Length, 11″.321.

Diameter, 1″.129.

Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000060	.000060	....	....	
3,000	3,000	.000110	.000050	....	....	
4,000	4,000	.000160	.000050	....	....	
5,000	5,000	.000210	.000050	.000010	.000010	
6,000	6,000	.000260	.000050	....	....	
7,000	7,000	.000310	.000050	....	....	
8,000	8,000	.000360	.000050	....	....	
9,000	9,000	.000410	.000050	....	....	
10,000	10,000	.000460	.000050	.000040	.000030	
11,000	11,000	.000510	.000050	....	....	
12,000	12,000	.000560	.000050	....	....	
13,000	13,000	.000610	.000050	....	....	
14,000	14,000	.000670	.000060	....	....	
15,000	15,000	.000710	.000040	.000060	.000020	
16,000	16,000	.000780	.000070	....	....	
17,000	17,000	.000830	.000050	....	....	
18,000	18,000	.000890	.000060	....	....	
19,000	19,000	.000950	.000060	....	....	
20,000	20,000	.001010	.000060	.000100	.000040	
21,000	21,000	.001090	.000080	....	....	
22,000	22,000	.001150	.000060	....	....	
23,000	23,000	.001210	.000060	....	....	
24,000	24,000	.001280	.000070	....	....	
25,000	25,000	.001340	.000060	.000210	.000110	
26,000	26,000	.001450	.000110	....	....	
27,000	27,000	.001510	.000060	....	....	
28,000	28,000	.001610	.000100	....	....	
29,000	29,000	.001710	.000100	....	....	
30,000	30,000	.001850	.000140	.000450	.000240	
31,000	31,000	.002000	.000150	....	....	
32,000	32,000	.002150	.000150	....	....	
33,000	33,000	.002280	.000130	....	....	
34,000	34,000	.002540	.000260	....	....	
35,000	35,000	.002800	.000260	.001110	.000660	
36,000	36,000	.003080	.000280	....	....	
37,000	37,000	.003370	.000290	....	....	
38,000	38,000	.003630	.000260	....	....	
39,000	39,000	.004010	.000380	....	....	
40,000	40,000	.004580	.000570	.002570	.001460	
59,050	59,050	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 715.

Marks, $\genfrac{}{}{0pt}{}{12\ \mathrm{M\ R_1\ T\ R_2}}{\mathrm{B\ R_2}}$
Length, 11''.355.
Diameter, 1''.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050	....	....	
3,000	3,000	.000100	.000050	....	....	
4,000	4,000	.000150	.000050	....	....	
5,000	5,000	.000200	.000050	0.	....	
6,000	6,000	.000240	.000040	....	....	
7,000	7,000	.000300	.000060	....	....	
8,000	8,000	.000350	.000050	....	....	
9,000	9,000	.000400	.000050	....	....	
10,000	10,000	.000450	.000050	.000020	.000020	
11,000	11,000	.000510	.000060	....	....	
12,000	12,000	.000560	.000050	....	....	
13,000	13,000	.000610	.000050	....	....	
14,000	14,000	.000680	.000070	....	....	
15,000	15,000	.000740	.000060	.000050	.000030	
16,000	16,000	.000790	.000050	....	....	
17,000	17,000	.000860	.000070	....	....	
18,000	18,000	.000920	.000060	....	....	
19,000	19,000	.000980	.000060	....	....	
20,000	20,000	.001050	.000070	.000110	.000060	
21,000	21,000	.001130	.000080	....	....	
22,000	22,000	.001190	.000060	....	....	
23,000	23,000	.001240	.000050	....	....	
24,000	24,000	.001320	.000080	....	....	
25,000	25,000	.001400	.000080	.000210	.000100	
26,000	26,000	.001490	.000090	....	....	
27,000	27,000	.001570	.000080	....	....	
28,000	28,000	.001660	.000090	....	....	
29,000	29,000	.001760	.000100	....	....	
30,000	30,000	.001890	.000130	.000440	.000230	
31,000	31,000	.002050	.000160	....	....	
32,000	32,000	.002210	.000160	....	....	
33,000	33,000	.002350	.000140	....	....	
34,000	34,000	.002600	.000250	....	....	
35,000	35,000	.002860	.000260	.001130	.000690	
36,000	36,000	.003150	.000290	....	....	
37,000	37,000	.003430	.000280	....	....	
38,000	38,000	.003740	.000310	....	....	
39,000	39,000	.004150	.000410	....	....	
40,000	40,000	.004660	.000510	.002650	.001520	
58,860	58,860	....	....	....	....	Ultimate strength.

Failed by triple flexure.

TENACITY SPECIMENS.

Marks, $12\ M\ R_1\ T\ R_2$

Number of test.	Nos.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inches.	*Sq. inch.*	*Pounds.*	*Pounds.*	
949	$B\ T_9\ O$	1.129	1.00	32,420	32,420	Granular mottled; the strongest specimens showing the finest grain.
950	$B\ T_{10}\ M$	1.129	1.00	30,600	30,600	
951	$B\ T_{11}\ I$	1.129	1.00	28,980	28,980	
952	$B\ T_{12}\ M$	1.129	1.00	32,650	32,650	
953	$B\ T_{13}\ O$	1.129	1.00	32,550	32,550	
954	$B\ R_{14}\ O$	1.129	1.00	31,680	31,680	
955	$B\ R_{15}\ M$	1.129	1.00	32,840	32,840	
956	$B\ R_{16}\ I$	1.129	1.00	32,280	32,280	
957	$B\ L_{17}\ I$	1.129	1.00	32,700	32,700	
958	$B\ L_{18}\ M$	1.129	1.00	32,600	32,600	
959	$B\ L_{19}\ O$	1.129	1.00	31,820	31,820	
960	$B\ L_{20}\ I$	1.129	1.00	31,330	31,330	

12-INCH B. L. RIFLED MORTAR, CAST-IRON BODY, MUZZLE INITIAL TENSION RING.

No. 2992.

Marks, $\frac{12\ M\ R_1\ T\ R_1}{M\ T_1\ I}$
Diameter, 1″.129.
Sectional area, 1 square inch.
Gauged length, 25″.

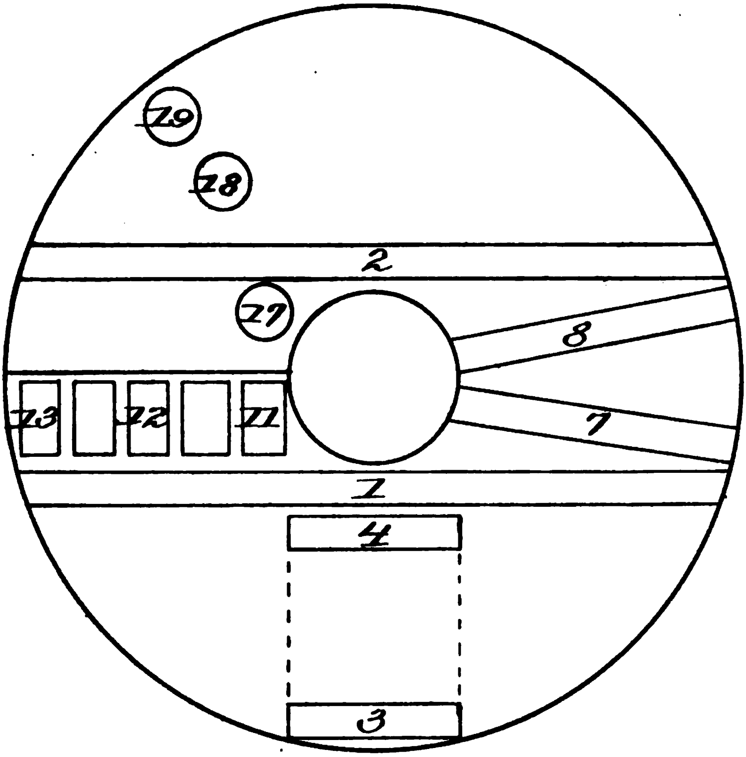
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000040	.000040	0.	....	
3,000	3,000	.000096	.000056	0.	....	
4,000	4,000	.000148	.000052	0.	....	
5,000	5,000	.000200	.000052	0.	....	
6,000	6,000	.000256	.000056	0.	....	
7,000	7,000	.000308	.000052	.000004	.000004	
8,000	8,000	.000360	.000052	.000008	.000004	
9,000	9,000	.000420	.000060	.000016	.000008	
10,000	10,000	.000476	.000056	.000028	.000012	
11,000	11,000	.000536	.000060	.000032	.000004	
12,000	12,000	.000608	.000072	.000044	.000012	
13,000	13,000	.000668	000060	.000056	.000012	
14,000	14,000	.000744	.000076	.000068	.000012	
15,000	15,000	.000816	.000072	.000084	.000016	
16,000	16,000	.000904	.000088	.000108	.000024	
17,000	17,000	.000976	.000072	.000136	.000028	
18,000	18,000	.001104	.000128	.000168	.000032	
19,000	19,000	.001200	.000096	.000208	.000040	
20,000	20,000	.001324	.000124	.000268	.000060	
21,000	21,000	.001480	.000156	.000364	.000096	
22,000	22,000	.001648	.000168	.000456	.000092	
23,000	23,000	.001868	.000220	.000588	.000132	
24,000	24,000	.002128	.000260	.000752	.000164	
25,000	25,000	....	....	....	....	Tensile strength.

Sustained maximum load ¼ minute, then fractured 1″.90 from neck. Appearance, granular, mottled.

12 inch B. L. Rifled Mortar

Cast iron body

Muzzle initial tension ring



No. 2993.

Marks, $\overset{\text{12 M R, T R}_1}{\text{M T}_2\text{ I}}$
Diameter, 1″.129.
Sectional area, 1 square inch.
Gauged length, 25″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load
2,000	2,000	.000044	.000044	0.	....	
3,000	3,000	.000092	.000048	0.	....	
4,000	4,000	.000140	.000048	0.	....	
5,000	5,000	.000192	.000052	0.	....	
6,000	6,000	.000240	.000048	0.	....	
7,000	7,000	.000296	.000056	0.	....	
8,000	8,000	.000352	.000056	.000004	.000004	
9,000	9,000	.000412	.000060	.000012	.000008	
10,000	10,000	.000468	.000056	.000020	.000008	
11,000	11,000	.000532	.000064	.000024	.000004	
12,000	12,000	.000600	.000068	.000032	.000008	
13,000	13,000	.000672	.000072	.000044	.000012	
14,000	14,000	.000748	.000076	.000060	.000016	
15,000	15,000	.000820	.000072	.000076	.000016	
16,000	16,000	.000912	.000092	.000100	.000024	
17,000	17,000	.001000	.000088	.000140	.000040	
18,000	18,000	.001104	.000104	.000168	.000028	
19,000	19,000	.001216	.000112	.000220	.000052	
20,000	20,000	.001360	.000144	.000280	.000060	
21,000	21,000	.001492	.000132	.000352	.000072	
22,000	22,000	.001684	.000192	.000460	.000108	
23,000	23,000	.001912	.000228	.000608	.000148	
24,000	24,000	.002288	.000376	.000864	.000256	
25,740	25,740	....	....	....	....	Tensile strength.

Fractured, 9″.50 from neck. Appearance, granular, mottled.

No. 718.

Marks, $\overset{12\,M\,R_1\,T\,R_1}{M\,T_2\,O}$.
Length, 12″.430.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050			
3,000	3,000	.000100	.000050			
4,000	4,000	.000140	.000040			
5,000	5,000	.000180	.000040	0.		
6,000	6,000	.000230	.000050			
7,000	7,000	.000280	.000050			
8,000	8,000	.000320	.000040			
9,000	9,000	.000370	.000050			
10,000	10,000	.000430	.000060	.000010	.000010	
11,000	11,000	.000480	.000050			
12,000	12,000	.000530	.000050			
13,000	13,000	.000580	.000050			
14,000	14,000	.000630	.000050			
15,000	15,000	.000680	.000050	.000020	.000010	
16,000	16,000	.000740	.000060			
17,000	17,000	.000810	.000070			
18,000	18,000	.000870	.000060			
19,000	19,000	.000920	.000050			
20,000	20,000	.000970	.000050	.000070	.000050	
21,000	21,000	.001040	.000070			
22,000	22,000	.001120	.000080			
23,000	23,000	.001180	.000060			
24,000	24,000	.001240	.000060			
25,000	25,000	.001330	.000090	.000170	.000100	
26,000	26,000	.001400	.000070			
27,000	27,000	.001490	.000090			
28,000	28,000	.001600	.000110			
29,000	29,000	.001700	.000100			
30,000	30,000	.001850	.000150	.000430	.000260	
31,000	31,000	.002010	.000160			
32,000	32,000	.002120	.000110			
33,000	33,000	.002300	.000180			
34,000	34,000	.002500	.000200			
35,000	35,000	.002800	.000300	.001130	.000700	
36,000	36,000	.003160	.000360			
37,000	37,000	.003410	.000250			
38,000	38,000	.003720	.000310			
39,000	39,000	.004220	.000500			
40,000	40,000	.004660	.000440	.002680	.001550	
54,300	54,300					Ultimate strength.

Failed by triple flexure.

No. 719.

Marks, $\frac{{}^{12}\text{M T R}_1\ \text{T R}_1}{\text{M T}_4\ \text{I}}$
Length, 12″.420.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050	....	....	
3,000	3,000	.000100	.000050	....	....	
4,000	4,000	.000160	.000060	....	....	
5.000	5,000	.000200	.000040	0.	....	
6,000	6,000	.000260	.000060	....	....	
7,000	7,000	.000310	.000050	....	....	
8,000	8,000	.000370	.000060	....	....	
9,000	9,000	.000410	.000040	....	....	
10,000	10,000	.000470	.000060	.000010	.000010	
11,000	11,000	.000520	.000050	....	....	
12,000	12,000	.000580	.000060	....	....	
13,000	13,000	.000640	.000060	....	....	
14,000	14,000	.000700	.000060	....	....	
15,000	15,000	.000740	.000040	.000050	.000040	
16,000	16,000	.000790	.000050	....	....	
17,000	17,000	.000850	.000060	....	....	
18,000	18,000	.000910	.000060	....	....	
19,000	19,000	.000960	.000050	....	....	
20,000	20,000	.001010	.000050	.000100	.000050	
21,000	21,000	.001070	.000060	....	....	
22,000	22,000	.001140	.000070	....	....	
23,000	23,000	.001200	.000060	....	....	
24,000	24,000	.001270	.000070	....	....	
25,000	25,000	.001350	.000080	.000190	.000090	
26,000	26,000	.001430	.000080	....	....	
27,000	27,000	.001500	.000070	....	....	
28,000	28,000	.001610	.000110	....	....	
29,000	29,000	.001710	.000100	....	....	
30,000	30,000	.001810	.000100	.000400	.000210	
31,000	31,000	.001920	.000110	....	....	
32,000	32,000	.002090	.000170	....	....	
33,000	33,000	.002230	.000140	....	....	
34,000	34.000	.002360	.000130	....	....	
35,000	35,000	.002580	.000220	.000960	.000540	
36,000	36,000	.002950	.000370	....	....	
37,000	37,000	.003260	.000310	....	....	
38,000	38,000	.003530	.000270	....	....	
39,000	39,000	.003900	.000370	....	....	
40,000	40,000	.004360	.000460	.002400	.001440	
53,960	53,960	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 716.

Marks, $\frac{12\,M\,R_1\,T\,R_1}{M\,R_1}$
Length, 11″.020.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050	....	....	
3,000	3,000	.000100	.000050	....	....	
4,000	4,000	.000140	.000040	....	....	
5,000	5,000	.000190	.000050	0.	....	
6,000	6,000	.000240	.000050	....	....	
7,000	7,000	.000280	.000040	....	....	
8,000	8,000	.000330	.000050	....	....	
9,000	9,000	.000380	.000050	....	....	
10,000	10,000	.000430	.000050	.000020	.000020	
11,000	11,000	.000470	.000040	....	....	
12,000	12,000	.000520	.000050	....	....	
13,000	13,000	.000570	.000050	....	....	
14,000	14,000	.000620	.000050	....	....	
15,000	15,000	.000670	.000050	.000030	.000010	
16,000	16,000	.000720	.000050	....	....	
17,000	17,000	.000770	.000050	....	....	
18,000	18,000	.000820	.000050	....	....	
19,000	19,000	.000880	.000060	....	....	
20,000	20,000	.000920	.000040	.000080	.000050	
21,000	21,000	.000990	.000070	....	....	
22,000	22,000	.001060	.000070	....	....	
23,000	23,000	.001120	.000060	....	....	
24,000	24,000	.001180	.000060	....	....	
25,000	25,000	.001270	.000090	.000180	.000100	
26,000	26,000	.001340	.000070	....	....	
27,000	27,000	.001420	.000080	....	....	
28,000	28,000	.001510	.000090	....	....	
29,000	29,000	.001610	.000100	....	....	
30,000	30,000	.001720	.000110	.000380	.000200	
31,000	31,000	.001870	.000150	....	....	
32,000	32,000	.001980	.000110	....	....	
33,000	33,000	.002150	.000170	....	....	
34,000	34,000	.002360	.000210	....	....	
35,000	35,000	.002620	.000260	.001010	.000630	
36,000	36,000	.002920	.000300	....	....	
37,000	37,000	.003160	.000240	....	....	
38,000	38,000	.003510	.000350	....	....	
39,000	39,000	.003850	.000340	....	....	
40,000	40,000	.004400	.000550	.002520	.001510	
57,300	57,300	....	....	....	....	Ultimate strength.

Failed by triple flexure.

No. 717.

Marks, $\frac{12\ M\ R_1\ T\ R_1}{M\ R_2}$
Length, 11".050.
Diameter, 1".129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050			
3,000	3,000	.000090	.000040			
4,000	4,000	.000140	.000050			
5,000	5,000	.000190	.000050	.000010	.000010	
6,000	6,000	.000240	.000050			
7,000	7,000	.000290	.000050			
8,000	8,000	.000330	.000040			
9,000	9,000	.000380	.000050			
10,000	10,000	.000430	.000050	.000020	.000010	
11,000	11,000	.000480	.000050			
12,000	12,000	.000530	.000050			
13,000	13,000	.000580	.000050			
14,000	14,000	.000630	.000050			
15,000	15,000	.000680	.000050	.000050	.000030	
16,000	16,000	.000730	.000050			
17,000	17,000	.000780	.000050			
18,000	18,000	.000840	.000060			
19,000	19,000	.000890	.000050			
20,000	20,000	.000950	.000060	.000100	.000050	
21,000	21,000	.001000	.000050			
22,000	22,000	.001060	.000060			
23,000	23,000	.001140	.000080			
24,000	24,000	.001200	.000060			
25,000	25,000	.001280	.000080	.000190	.000090	
26,000	26,000	.001350	.000070			
27,000	27,000	.001440	.000090			
28,000	28,000	.001540	.000100			
29,000	29,000	.001640	.000100			
30,000	30,000	.001740	.000100	.000410	.000220	
31,000	31,000	.001940	.000200			
32,000	32,000	.002040	.000100			
33,000	33,000	.002200	.000160			
34,000	34,000	.002450	.000250			
35,000	35,000	.002700	.000250	.001090	.000680	
36,000	36,000	.003010	.000310			
37,000	37,000	.003290	.000280			
38,000	38,000	.003660	.000370			
39,000	39,000	.004000	.000340			
40,000	40,000	.004490	.000490	.002590	.001500	
56,800	56,800					Ultimate strength.

Failed by triple flexure.

TENACITY SPECIMENS.

Marks, 12 M R_1 T R_1.

No. of test.	Numbers.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inches.	*Square inch*	*Pounds.*	*Pounds.*	
943	M T_{11} I	1.129	1.00	40,220	40,220	Granular mottled, the strongest specimens showing the finest grain.
944	M T_{12} M	1.129	1.00	34,500	34,500	
945	M T_{13} O	1.129	1.00	37,700	37,700	
946	M L_{17} I	1.129	1.00	32,820	32,820	
947	M L_{18} M	1.129	1.00	31,260	31,260	
948	M L_{19} O	1.129	1.00	31,710	31,710	

ONE END OF TRUNNION HOOP.

No. 2854.

Marks, 12 M R$_{T_1}$ T$_{I}$ H
Diameter, ".564.
Sectional area, .25 square inch.

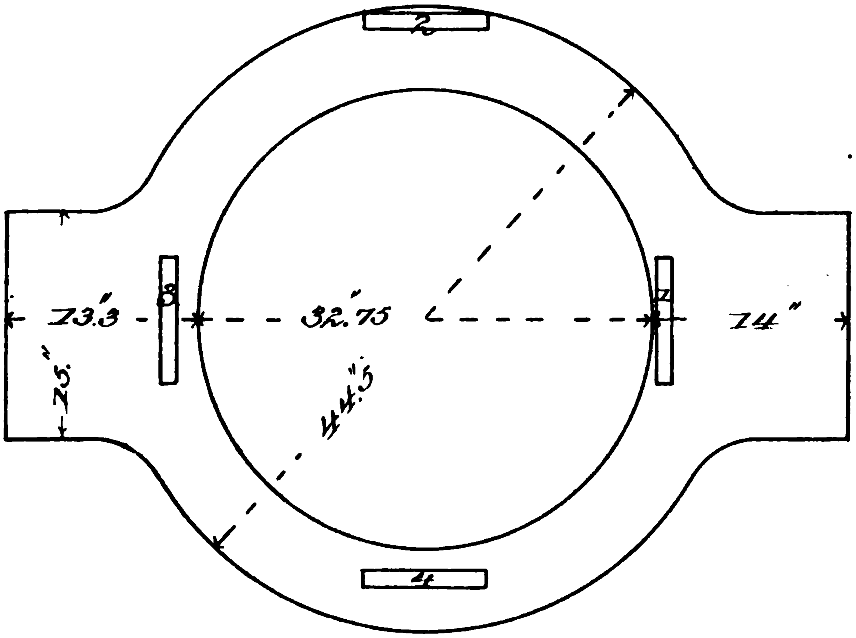
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000317	.000167	0.		
3,750	15,000	.000500	.000183	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167			
10,000	40,000	.001333	.000166			
11,250	45,000	.001517	.000184			
12,500	50,000	.001683	.000166			
12,750	51,000	.001717	.000034			
13,000	52,000	.001750	.000033			
13,250	53,000	.001783	.000033			
13,500	54,000	.001817	.000034			
13,750	55,000	.001850	.000033			
14,000	56,000	.001883	.000033			
14,250	57,000	.001917	.000034			
14,500	58,000	.001950	.000033			
14,750	59,000	.002000	.000050			
15,000	00,000	.002050	.000050			Elastic limit.
15,250	61,000	.002167	.000117			
15,500	62,000	.003167	.001000			
15,750	63,000	.004133	.000966			
16,000	64,000	.005017	.000884			
16,500	66,000	.006350	.001333			
17,000	68,000	.007833	.001483			
17,500	70,000	.009833	.002000			
18,000	72,000	.011167	.001334			
18,500	74,000	.012433	.001266			
19,000	76,000	.014000	.001567			
19,500	78,000	.015667	.001667			
20,000	80,000	.017267	.001600			
20,500	82,000	.019017	.001750			
21,000	84,000	.021167	.002150			
21,500	86,000	.022833	.001666			
22,000	88,000	.024917	.002084			
22,500	90,000	.027000	.002083			
23,000	92,000	.0300	.0030			
23,500	94,000	.0333	.0033			
24,000	96,000	.0350	.0017			
24,500	98,000	.0383	.0033			
25,000	100,000	.0433	.0050			
25,500	102,000	.0467	.0034			
26,000	104,000	.0517	.0050			
26,500	106,000	.0617	.0100			
27,000	108,000	.0700	.0083			
27,500	110,000	.0983	.0283			
27,530	110,120	.1133	.0150			Tensile strength.

General summary.

Tensile strength per square inch of original section........pounds..	110,120
Elastic limit per square inch of original section........do....	60,000
Elongation per inch after rupture........inch..	0.1717
Elongation per inch under strain at elastic limit........do....	.002050
Reduction in diameter at point of rupture........do....	.114
Reduction in area after rupture, per centum of original section........	36.4
Position of rupture........	2".70 from neck
Character of broken surface........	silky, interspersed with fine granulation
Elongation of inch sections........	".14, ".16, ".14, ".30, ".17, ".12

12 inch B. L. Rifled Mortar

One end of Trunnion hoop



No. 2855.

Marks, $^{12\,M\,B_1\,T\,H}_{\quad T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001767	.000050	....	....	
13,500	54,000	.001817	.000050	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001950	.000033	....	....	
14,750	59,000	.001983	.000033	....	....	
15,000	60,000	.002033	.000050	....	....	Elastic limit.
15,250	61,000	.002500	.000467	....	....	
15,500	62,000	.003300	.000800	....	....	
15,750	63,000	.004000	.000700	....	....	
16,000	64,000	.004917	.000917	....	....	
16,500	66,000	.006600	.001683	....	....	
17,000	68,000	.008167	.001567	....	....	
17,500	70,000	.009667	.001500	....	....	
18,000	72,000	.011500	.001833	....	....	
18,500	74,000	.013167	.001667	....	....	
19,000	76,000	.014667	.001500	....	....	
19,500	78,000	.016200	.001533	....	....	
20,000	80,000	.018000	.001800	....	....	
20,500	82,000	.019767	.001767	....	....	
21,000	84,000	.021667	.001900	....	....	
21,500	86,000	.023833	.002166	....	....	
22,000	88,000	.026083	.002250	....	....	
22,500	90,000	.028083	.002000	....	....	
23,000	92,000	.0317	.003617	....	....	
23,500	94,000	.0350	.0033	....	....	
24,000	96,000	.0383	.0033	....	....	
24,500	98,000	.0400	.0017	....	....	
25,000	100,000	.0467	.0067	....	....	
25,500	102,000	.0500	.0033	....	....	
26,000	104,000	.0583	.0083	....	....	
26,500	106,000	.0683	.0100	....	....	
26,940	107,760	.0967	.0284	....	....	Tensile strength.

General summary.

Specific gravity	7.8633
Hardness	23.43
Tensile strength per square inch of original section ....pounds..	107,760
Elastic limit per square inch of original section ....do ...	60,000
Elongation per inch after rupture ....inch..	0.1800
Elongation per inch under strain at elastic limit ....do....	.002033
Reduction in diameter at point of rupture ....do....	.184
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	2″.25 from neck
Character of broken surface	silky; trace of granulation
Elongation of inch sections	″.06, ″.07, ″.09, ″.20, ″.25*, ″.11

No. 2856.

Marks, $^{12}\,\mathrm{M\,R,\,T\,H}$ $_{\mathrm{T,\,M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000850	.000183	0.	....	
7,500	30,000	.001050	.000200	0.	....	
8,750	35,000	.001200	.000150	0.	....	
10,000	40,000	.001383	.000183	.000017	....	
11,250	45,000	.001550	.000167	....	....	
12,500	50,000	.001733	.000183	....	....	
12,750	51,000	.001783	.000050	....	....	
13,000	52,000	.001833	.000050	....	....	
13,250	53,000	.001867	.000034	....	....	Elastic limit.
13,500	54,000	.001933	.000066	....	....	
13,750	55,000	.002083	.000150	....	....	
14,000	56,000	.003000	.000917	....	....	
14,250	57,000	.003750	.000750	....	....	
14,500	58,000	.004583	.000833	....	....	
14,750	59,000	.005217	.000634	....	....	
15,000	60,000	.006033	.000816	....	....	
15,500	62,000	.007350	.001317	....	....	
16,000	64,000	.008667	.001317	....	....	
16,500	66,000	.010333	.001666	....	....	
17,000	68,000	.011867	.001534	....	....	
17,500	70,000	.013500	.001633	....	....	
18,000	72,000	.015000	.001500	....	....	
18,500	74,000	.016667	.001667	....	....	
19,000	76,000	.018500	.001833	....	....	
19,500	78,000	.020333	.001833	....	....	
20,000	80,000	.022250	.001917	....	....	
20,500	82,000	.024333	.002083	....	....	
21,000	84,000	.026583	.002250	....	....	
21,500	86,000	.029167	.002584	....	....	
22,000	88,000	.0317	.002533	....	....	
22,500	90,000	.0350	.0033	....	....	
23,000	92,000	.0383	.0033	....	....	
23,500	94,000	.0417	.0034	....	....	
24,000	96,000	.0467	.0050	....	....	
24,500	98,000	.0517	.0050	....	....	
25,000	100,000	.0583	.0066	....	....	
25,500	102,000	.0667	.0084	....	....	
26,000	104,000	.0917	.0250	....	....	
26,080	104,320	.0983	.0066	....	....	Tensile strength.

General summary.

Specific gravity		7.85
Hardness		30.9
Tensile strength per square inch of original section	pounds	104,3
Elastic limit per square inch of original section	do	53,00
Elongation per inch after rupture	inch	0.123
Elongation per inch under strain at elastic limit	do	.0018
Reduction in diameter at point of rupture	do	.0
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1 inch from neck
Character of broken surface		granular; silky spot at circumference
Elongation of inch sections		".06, ".08, ".08, ".11, ".14, ".

No. 2857.

Marks, $^{12}\underset{\mathrm{T_4M}}{\mathrm{MR_1TH}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	0.	....	
11,250	45,000	.001500	.000150	....	....	
12,500	50,000	.001683	.000183	....	....	
12,750	51,000	.001733	.000050	....	....	
13,000	52,000	.001783	.000050	....	....	
13,250	53,000	.001817	.000034	....	....	
13,500	54,000	.001850	.000033	....	....	
13,750	55,000	.001883	.000033	....	....	
14,000	56,000	.001967	.000084	....	....	
14,250	57,000	.002017	.000050	....	....	Elastic limit.
14,500	58,000	.002217	.000200	....	....	
14,750	59,000	.002550	.000333	....	....	
15,000	60,000	.003100	.000550	....	....	
15,500	62,000	.004500	.001400	....	....	
16,000	64,000	.006167	.001667	....	....	
16,500	66,000	.007750	.001583	....	....	
17,000	68,000	.009417	.001667	....	....	
17,500	70,000	.011167	.001750	....	....	
18,000	72,000	.012833	.001666	....	....	
18,500	74,000	.014500	.001667	....	....	
19,000	76,000	.016167	.001667	....	....	
19,500	78,000	.017867	.001700	....	....	
20,000	80,000	.019917	.002050	....	....	
20,500	82,000	.021733	.001816	....	....	
21,000	84,000	.024200	.002467	....	....	
21,500	86,000	.026500	.002300	....	....	
22,000	88,000	.029167	.002667	....	....	
22,500	90,000	.031367	.002200	....	....	
23,000	92,000	.0350	.003633	....	....	
23,500	94,000	.0383	.0033	....	....	
24,000	96,000	.0433	.0050	....	....	
24,500	98,000	.0483	.0050	....	....	
25,000	100,000	.0533	.0050	....	....	
25,500	102,000	.0633	.0100	....	....	
26,000	104,000	.0750	.0117	....	....	
26,400	105,600	.1067	.0317	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105,600
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1383
Elongation per inch under strain at elastic limit	do....	.002017
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.12 from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		″.23, ″.18, ″.10, ″.11, ″.11, ″.10

OTHER END OF TRUNNION HOOP.

No. 2858.

Marks, 12 M B, T H
T5 M
Diameter, ".564.
Sectional area, .25 square inch.

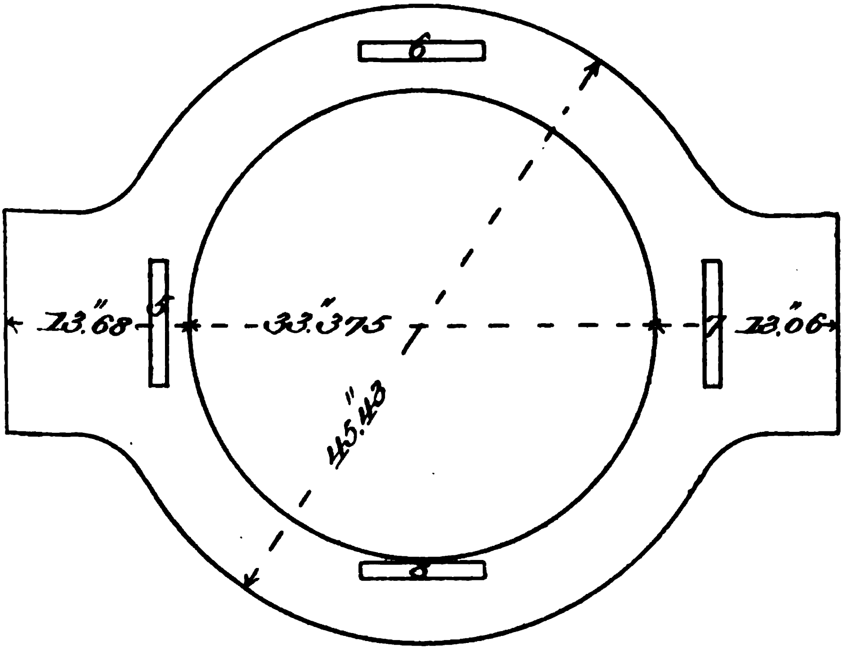
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000850	.000183	0.	....	
7,500	30,000	.001033	.000183	.000017	.000017	
8,750	35,000	.001200	.000167	.000017	.0	
10,000	40,000	.001383	.000183	.000033	.000016	
11,250	45,000	.001550	.000167	....	....	
12,500	50,000	.001717	.000167	....	....	
12,750	51,000	.001750	.000033	....	....	
13,000	52,000	.001817	.000067	....	....	
13,250	53,000	.001867	.000050	....	....	
13,500	54,000	.001900	.000033	....	....	
13,750	55,000	.001933	.000033	....	....	
14,000	56,000	.001983	.000083	....	....	Elastic limit.
14,250	57,000	.002133	.000050	....	....	
14,500	58,000	.003500	.000150	....	....	
14,750	59,000	.005017	.001367	....	....	
15,000	60,000	.005917	.001517	....	....	
15,500	62,000	.007417	.000900	....	....	
16,000	64,000	.008933	.001500	....	....	
16,500	66,000	.010500	.001516	....	....	
17,000	68,000	.011917	.001567	....	....	
17,500	70,000	.013583	.001417	....	....	
18,000	72,000	.015200	.001666	....	....	
18,500	74,000	.017167	.001617	....	....	
19,000	76,000	.018767	.001967	....	....	
19,500	78,000	.020750	.001600	....	....	
20,000	80,000	.022833	.001983	....	....	
20,500	82,000	.025000	.002083	....	....	
21,000	84,000	.027333	.002167	....	....	
21,500	86,000	.029833	.002333	....	....	
22,000	88,000	.0333	.002500	....	....	
22,500	90,000	.0350	.003467	....	....	
23,000	92,000	.0383	.0017	....	....	
23,500	94,000	.0450	.0033	....	....	
24,000	96,000	.0483	.0067	....	....	
24,500	98,000	.0533	.0033	....	....	
25,000	100,000	.0633	.0050	....	....	
25,500	102,000	.0750	.0100	....	....	
25,960	103,960	.1167	.0117	....	....	
			.0417	....	....	Tensile strength.

General summary.

Specific gravity 7.8540
Hardness 21.17
Tensile strength per square inch of original section .... pounds.. 103,960
Elastic limit per square inch of original section .... do.... 56,000
Elongation per inch after rupture .... inch.. 0.1467
Elongation per inch under strain at elastic limit .... do.... .001983
Reduction in diameter at point of rupture .... do.... .114
Reduction in area after rupture, per centum of original section 38.4
Position of rupture .... 1".50 from neck.
Character of broken surface .... granular, 75 per cent.; silky, 25 per cent.
Elongation of inch sections .... ".13, ".29", ".13, ".11, ".11, ".11

12 inch B. L. Rifled Mortar

Other end of Trunnion hoop



No. 2859.

Marks, $^{12\,\mathrm{M\,R,\,T\,H}}_{\quad\mathrm{T_s\,M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.000967	.000150	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001717	.000017	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	Elastic limit.
14,000	56,000	.002033	.000200	....	....	
14,250	57,000	.004500	.002467	....	....	
14,500	58,000	.005417	.000917	....	....	
14,750	59,000	.006333	.000916	....	....	
15,000	60,000	.007000	.000667	....	....	
15,500	62,000	.008067	.001067	....	....	
16,000	64,000	.010417	.002350	....	....	
16,500	66,000	.012167	.001750	....	....	
17,000	68,000	.013667	.001500	....	....	
17,500	70,000	.015500	.001833	....	....	
18,000	72,000	.017417	.001917	....	....	
18,500	74,000	.019367	.001950	....	....	
19,000	76,000	.021167	.001800	....	....	
19,500	78,000	.023667	.002500	....	....	
20,000	80,000	.026000	.002333	....	....	
20,500	82,000	.028333	.002333	....	....	
21,000	84,000	.031333	.003000	....	....	
21,500	86,000	.034167	.002834	....	....	
22,000	88,000	.0383	.004133	....	....	
22,500	90,000	.0433	.0050	....	....	
23,000	92,000	.0467	.0034	....	....	
23,500	94,000	.0533	.0066	....	....	
24,000	96,000	.0617	.0084	....	....	
24,500	98,000	.0733	.0116	....	....	
25,000	100,000	.1033	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	100,000
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1".75 from neck
Character of broken surface		silky
Elongation of inch sections		".07, ".08, ".10, ".12, ".38*, ".15

No. 2860.

Marks, $^{12}\,\mathrm{M\,R,\,T\,H}\atop \mathrm{T,\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000633	.000183	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001467	.000150	....	....	
12,500	50,000	.001667	.000200	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	Elastic limit.
13,500	54,000	.001883	.000116	....	....	
13,750	55,000	.002300	.000417	....	....	
14,000	56,000	.004333	.002033	....	....	
14,250	57,000	.005667	.001334	....	....	
14,500	58,000	.006667	.001000	....	....	
14,750	59,000	.007500	.000833	....	....	
15,000	60,000	.008333	.000833	....	....	
15,500	62,000	.009683	.001350	....	....	
16,000	64,000	.011333	001650	....	....	
16,500	66,000	.013000	.001667	....	....	
17,000	68,000	.014833	.001833	....	....	
17,500	70,000	.016667	.001834	....	....	
18,000	72,000	.018333	.001666	....	....	
18,500	74,000	.020533	.002200	....	....	
19,000	76,000	.023000	.002467	....	....	
19,500	78,000	.025167	.002167	....	....	
20,000	80,000	.027417	.002250	....	....	
20,500	82,000	.030000	.002583	....	....	
21,000	84,000	.0333	.0033	....	....	
21,500	86,000	.0367	.0034	....	....	
22,000	88,000	.0400	.0033	....	....	
22,500	90,000	.0450	.0050	....	....	
23,000	92,000	.0500	.0050	....	....	
23,500	94,000	.0567	.0067	....	....	
24,000	96,000	.0667	.0100	....	....	
24,500	98,000	.0817	.0150	....	....	
24,920	99,680	.1283	.0466	....	....	Tensile strength.

General summary.

Specific gravity		7.8580
Hardness		12.70
Tensile strength per square inch of original section	pounds	99,680
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.1533
Elongation per inch under strain at elastic limit	do	.001767
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		2″.05 from neck
Character of broken surface		granular; silky spot at circumference
Elongation of inch sections		″.13, ″.28*, ″.12, ″.14, ″.13, ″.11

No. 2861.

Marks, $^{12\,\mathrm{M\,R_1\,T\,H}}_{\mathrm{T_3\,I}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001750	.000050	....	....	
13,250	53,000	.001783	.000033	....	....	Elastic limit.
13,500	54,000	.001867	.000084	....	....	
13,750	55,000	.002083	.000216	....	....	
14,000	56,000	.002483	.000400	....	....	
14,250	57,000	.003000	.000517	....	....	
14,500	58,000	.003833	.000833	....	....	
14,750	59,000	.004667	.000834	....	....	
15,000	60,000	.005583	.000916	....	....	
15,500	62,000	.007167	.001584	....	....	
16,000	64,000	.008833	.001666	....	....	
16,500	66,000	.010333	.001500	....	....	
17,000	68,000	.012167	.001834	....	....	
17,500	70,000	.013833	.001666	....	....	
18,000	72,000	.015500	.001667	....	....	
18,500	74,000	.017267	.001767	....	....	
19,000	76,000	.019167	.001900	....	....	
19,500	78,000	.021167	.002000	....	....	
20,000	80,000	.023833	.002166	....	....	
20,500	82,000	.025833	.002500	....	....	
21,000	84,000	.028333	.002500	....	....	
21,500	86,000	.031250	.002917	....	....	
22,000	88,000	.033833	.002583	....	....	
22,500	90,000	.0383	.004467	....	....	
23,000	92,000	.0417	.0034	....	....	
23,500	94,000	.0467	.0050	....	....	
24,000	96,000	.0517	.0050	....	....	
24,500	98,000	.0617	.0100	....	....	
25,000	100,000	.0717	.0100	....	....	
25,520	102,080	.1117	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102,080
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1533
Elongation per inch under strain at elastic limit	do....	.001783
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1".40 from neck
Character of surface		silky; trace of granulation
Elongation of inch sections		".08, ".08, ".11, ".15, ".33*, ".17

HOOP A_3.

Exterior diameter, 36″.75.
Interior diameter, 30″.25.

No. 2866.

Marks, $^{12}\frac{M}{T_1}\frac{R_1}{M}A_3$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30 000	.001000	.000167	0.	....	
8, 750	35, 000	.001183	.000183	0.	....	
10, 000	40, 000	.001350	.000167	0.	....	
11, 250	45, 000	.001533	.000183	....	....	
12, 500	50, 000	.001700	.000167	....	....	
12, 750	51, 000	.001750	.000050	....	....	
13, 000	52, 000	.001783	.000033	....	....	
13, 250	53, 000	.001817	.000034	....	....	
13, 500	54, 000	.001867	.000050	....	....	
13, 750	55, 000	.001900	.000033	....	....	
14, 000	56, 000	.001950	.000050	....	....	
14, 250	57, 000	.001983	.000033	....	....	
14, 500	58, 000	.002017	.000034	....	....	
14, 750	59, 000	.002050	.000033	....	....	
15, 000	60, 000	.002083	.000033	....	....	
15, 250	61, 000	.002117	.000034	....	....	
15, 500	62, 000	.002150	.000033	....	....	
15, 750	63, 000	.002200	.000050	....	....	Elastic limit.
16, 000	64, 000	.002750	.000550	....	....	
16, 250	65, 000	.003533	.000783	....	....	
16, 500	66, 000	.005000	.001467	....	....	
17, 000	68, 000	.006833	.001833	....	....	
17, 500	70, 000	.008500	.001667	....	....	
18, 000	72, 000	.010000	.001500	....	....	
18, 500	74, 000	.011500	.001500	....	....	
19, 000	76, 000	.013117	.001617	....	....	
19, 500	78, 000	.014667	.001550	....	....	
20, 000	80, 000	.016167	.001500	....	....	
20, 500	82, 000	.017783	.001616	....	....	
31, 000	84, 000	.019667	.001884	....	....	
21, 500	86, 000	.021500	.001833	....	....	
22, 000	88, 000	.023750	.002250	....	....	
22, 500	90, 000	.025900	.002150	....	....	
23, 000	92, 000	.027500	.001600	....	....	
23, 500	94, 000	.0300	.0025	....	....	
24, 000	96, 000	.0333	.0033	....	....	
24, 500	98, 000	.0367	.0034	....	....	
25, 000	100, 000	.0400	.0033	....	....	
25, 500	102, 000	.0450	.0050	....	....	
26, 000	104, 000	.0517	.0067	....	....	
26, 500	106, 000	.0567	.0050	....	....	
27, 000	108, 000	.0667	.0100	....	....	
27, 500	110, 000	.0933	.0266	....	....	
27, 540	110, 160	.1050	.0117	....	....	Tensile strength.

General summary.

Specific gravity	7.8804
Hardness	25.63
Tensile strength per square inch of original section ......pounds..	110, 160
Elastic limit per square inch of original section ......do....	63, 000
Elongation per inch after rupture ......inch..	0.1400
Elongation per inch under strain at elastic limit ......do....	.002200
Reduction in diameter at point of rupture ......do....	.144
Reduction in area after rupture, per centum of original section	44.6
Position of rupture	3 inches from neck
Character of broken surface	silky
Elongation of inch sections	″.07, ″.12, ″.25*, ″.12, ″.10, ″.07

No. 2867.

Marks, $^{12}\substack{M\ R_1\ A_2 \\ T_2\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.		
2, 500	10, 000	.000300	.000167	0.		
3, 750	15, 000	.000467	.000167	0.		
5, 000	20, 000	.000633	.000166	0.		
6, 250	25, 000	.000800	.000167	0.		
7, 500	30, 000	.000967	.000167	0.		
8. 750	35, 000	.001133	.000166	0.		
10, 000	40, 000	.001317	.000184	0.		
11, 250	45, 000	.001483	.000166			
12, 500	50, 000	.001650	.000167			
13, 750	55, 000	.001817	.000167			
14, 000	56, 000	.001850	.000033			
14, 250	57, 000	.001883	.000033			
14, 500	58, 000	.001933	.000050			
14, 750	59, 000	.001967	.000034			
15, 000	60, 000	.002000	.000033			
15, 250	61, 000	.002033	.000033			
15, 500	62, 000	.002067	.000034			
15, 750	63, 000	.002100	.000033			
16, 000	64, 000	.002133	.000033			
16, 250	65, 000	.002167	.000034			
16, 500	66, 000	.002200	.000033			
16, 750	67, 000	.002250	.000050			Elastic limit.
17, 000	68, 000	.002333	.000083			
17, 250	69, 000	.002433	.000100			
17, 500	70, 000	.002917	.000484			
18, 000	72, 000	.004183	.001266			
18, 500	74, 000	.006000	.001817			
19, 000	76, 000	.007567	.001567			
19, 500	78, 000	.009333	.001766			
20, 000	80, 000	.010667	.001334			
20, 500	82, 000	.012300	.001633			
21, 000	84, 000	.013750	.001450			
21, 500	86, 000	.015500	.001750			
22, 000	88, 000	.017333	.001833			
22, 500	90, 000	.018933	.001600			
23, 000	92, 000	.020833	.001900			
23, 500	94, 000	.022750	.001917			
24, 000	96, 000	.024500	.001750			
24, 500	98, 000	.027000	.002500			
25, 000	100, 000	.0283	.0013			
25, 500	102, 000	.0317	.0034			
26, 000	104, 000	.0367	.0050			
26, 500	106, 000	.0383	.0016			
27, 000	108, 000	.0433	.0050			
27, 500	110, 000	.0483	.0050			
28. 000	112, 000	.0533	.0050			
28, 500	114, 000	.0633	.0100			
29, 000	116, 000	.0817	.0184			
29, 060	116, 240	.0933	.0116			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	116, 240
Elastic limit per square inch of original section	do....	67, 000
Elongation per inch after rupture	inch..	0. 1217
Elongation per inch under strain at elastic limit	do ...	.002250
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		2″.20 from neck
Character of broken surface		silky, trace of granulation
Elongation of inch sections		″.05, ″.07, ″.09, ″.17, ″.25*, ″.10

No. 2868.

Marks, $^{12}\frac{\text{M}}{\text{T}_3}\frac{\text{R}_1}{\text{M}}\text{A}_3$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000467	.000184	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001333	.000183	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001717	.000017	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001833	.000050	....	....	
14,000	56,000	.001883	.000050	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001967	.000050	....	....	Elastic limit.
14,750	59,000	.002067	.000100	....	....	
15,000	60,000	.002367	.000300	....	....	
15,250	61,000	.003017	.000650	....	....	
15,500	62,000	.004083	.001066	....	....	
16,000	64,000	.005933	.001850	....	....	
16,500	66,000	.007833	.001900	....	....	
17,000	68,000	.009500	.001667	....	....	
17,500	70,000	.011133	.001633	....	....	
18,000	72,000	.012750	.001617	....	....	
18,500	74,000	.014500	.001750	....	....	
19,000	76,000	.016333	.001833	....	....	
19,500	78,000	.018183	.001850	....	....	
20,000	80,000	.020250	.002067	....	....	
20,500	82,000	.022500	.002250	....	....	
21,000	84,000	.024583	.002083	....	....	
21,500	86,000	.027500	.002917	....	....	
22,000	88,000	.029833	.002333	....	....	
22,500	90,000	.0333	.003467	....	....	
23,000	92,000	.0367	.0034	....	....	
23,500	94,000	.0400	.0033	....	....	
24,000	96,000	.0450	.0050	....	....	
24,500	98,000	.0517	.0067	....	....	
25,000	100,000	.0567	.0050	....	....	
25,500	102,000	.0700	.0133	....	....	
26,000	104,000	.0900	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	104,000
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1433
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1".3 from neck
Character of broken surface		silky
Elongation of inch sections		".11, ".36, ".12, ".10, ".09, ".08

No. 2869.

Marks, $^{12\,\mathrm{M}\,\mathrm{R}_1\,\mathrm{A}_2}_{\mathrm{T}_4\,\mathrm{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001817	.000050	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001950	.000033	....	....	
14,750	59,000	.002000	.000050	....	....	
15,000	60,000	.002050	.000050	....	....	
15,250	61,000	.002100	.000050	....	....	
15,500	62,000	.002133	.000033	....	....	
15,750	63,000	.002167	.000034	....	....	
16,000	64,000	.002200	.000033	....	....	Elastic limit.
16,250	65,000	.002300	.000100	....	....	
16,500	66,000	.002400	.000100	....	....	
16,750	67,000	.002550	.000150	....	....	
17,000	68,000	.002967	.000417	....	....	
17,500	70,000	.004783	.001816	....	....	
18,000	72,000	.006667	.001884	....	....	
18,500	74,000	.008300	.001633	....	....	
19,000	76,000	.009883	.001583	....	....	
19,500	78,000	.011500	.001617	....	....	
20,000	80,000	.013117	.001617	....	....	
20,500	82,000	.014750	.001633	....	....	
21,000	84,000	.016500	.001750	....	....	
21,500	86,000	.018350	.001850	....	....	
22,000	88,000	.020283	.001933	....	....	
22,500	90,000	.022333	.002050	....	....	
23,000	92,000	.024833	.002500	....	....	
23,500	94,000	.026867	.002034	....	....	
24,000	96,000	.029500	.002633	....	....	
24,500	98,000	.031883	.002383	....	....	
25,000	100,000	.034167	.002284	....	....	
25,500	102,000	.0367	.002533	....	....	
26,000	104,000	.0433	.0066	....	....	
26,500	106,000	.0500	.0067	....	....	
27,000	108,000	.0550	.0050	....	....	
27,500	110,000	.0650	.0100	....	....	
27,890	111,560	.0917	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,560
Elastic limit per square inch of original section	do....	64,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.002200
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.65 from neck
Character of broken surface		silky; slightly granular
Elongation of inch sections		″.11, ″.32*, ″.12, ″.09, ″.07, ″.07

No. 2859.

Marks, $^{12\ \mathrm{M\ R_1\ T\ H}}_{\mathrm{T_6\ M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.000967	.000150	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001717	.000017	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	Elastic limit.
14,000	56,000	.002033	.000200	....	....	
14,250	57,000	.004500	.002467	....	....	
14,500	58,000	.005417	.000917	....	....	
14,750	59,000	.006333	.000916	....	....	
15,000	60,000	.007000	.000667	....	....	
15,500	62,000	.008067	.001067	....	....	
16,000	64,000	.010417	.002350	....	....	
16,500	66,000	.012167	.001750	....	....	
17,000	68,000	.013667	.001500	....	....	
17,500	70,000	.015500	.001833	....	....	
18,000	72,000	.017417	.001917	....	....	
18,500	74,000	.019367	.001950	....	....	
19,000	76,000	.021167	.001800	....	....	
19,500	78,000	.023667	.002500	....	....	
20,000	80,000	.026000	.002333	....	....	
20,500	82,000	.028333	.002333	....	....	
21,000	84,000	.031333	.003000	....	....	
21,500	86,000	.034167	.002834	....	....	
22,000	88,000	.0383	.004133	....	....	
22,500	90,000	.0433	.0050	....	....	
23,000	92,000	.0467	.0034	....	....	
23,500	94,000	.0533	.0066	....	....	
24,000	96,000	.0617	.0084	....	....	
24,500	98,000	.0733	.0116	....	....	
25,000	100,000	.1033	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	100,000
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1500
Elongation per inch under strain at elastic limit	do	.001833
Reduction in diameter at point of rupture	do	.184
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1".75 from neck
Character of broken surface		silky
Elongation of inch sections		".07, ".08, ".10, ".12, ".33, ".15

No. 2860.

Marks, $^{12\ \mathrm{M\ R_1\ T\ H}}_{\mathrm{T_{\prime}O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000283	.000166	0.		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000633	.000183	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000983	.000183	0.		
8,750	35,000	.001150	.000167	0.		
10,000	40,000	.001317	.000167	0.		
11,250	45,000	.001467	.000150			
12,500	50,000	.001667	.000200			
12,750	51,000	.001700	.000033			
13,000	52,000	.001733	.000033			
13,250	53,000	.001767	.000034			Elastic limit.
13,500	54,000	.001883	.000116			
13,750	55,000	.002300	.000417			
14,000	56,000	.004333	.002033			
14,250	57,000	.005667	.001334			
14,500	58,000	.006667	.001000			
14,750	59,000	.007500	.000833			
15,000	60,000	.008333	.000833			
15,500	62,000	.009683	.001350			
16,000	64,000	.011333	001650			
16,500	66,000	.018000	.001667			
17,000	68,000	.014833	.001833			
17,500	70,000	.016667	.001834			
18,000	72,000	.018333	.001666			
18,500	74,000	.020533	.002200			
19,000	76,000	.023000	.002467			
19,500	78,000	.025167	.002167			
20,000	80,000	.027417	.002250			
20,500	82,000	.030000	.002583			
21,000	84,000	.0333	.0033			
21,500	86,000	.0367	.0034			
22,000	88,000	.0400	.0033			
22,500	90,000	.0450	.0050			
23,000	92,000	.0500	.0050			
23,500	94,000	.0567	.0067			
24,000	96,000	.0667	.0100			
24,500	98,000	.0817	.0150			
24,920	99,680	.1283	.0466			Tensile strength.

General summary.

Specific gravity		7.8580
Hardness		18.79
Tensile strength per square inch of original section	pounds..	99,680
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1633
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		2″.05 from neck
Character of broken surface		granular; silky spot at circumference
Elongation of inch sections		″.13, ″.28*, ″.19, ″.14, ″.12, ″.11

No. 2861.

Marks, $\overset{12\ \mathrm{M\ R,\ T\ H}}{\mathrm{T_s\ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001750	.000050	....	....	
13,250	53,000	.001783	.000033	....	....	Elastic limit.
13,500	54,000	.001867	.000084	....	....	
13,750	55,000	.002083	.000216	....	....	
14,000	56,000	.002483	.000400	....	....	
14,250	57,000	.003000	.000517	....	....	
14,500	58,000	.003833	.000833	....	....	
14,750	59,000	.004667	.000834	....	....	
15,000	60,000	.005583	.000916	....	....	
15,500	62,000	.007167	.001584	....	....	
16,000	64,000	.008833	.001666	....	....	
16,500	66,000	.010333	.001500	....	....	
17,000	68,000	.012167	.001834	....	....	
17,500	70,000	.013833	.001666	....	....	
18,000	72,000	.015500	.001667	....	....	
18,500	74,000	.017267	.001767	....	....	
19,000	76,000	.019167	.001900	....	....	
19,500	78,000	.021167	.002000	....	....	
20,000	80,000	.023333	.002166	....	....	
20,500	82,000	.025833	.002500	....	....	
21,000	84,000	.028333	.002500	....	....	
21,500	86,000	.031250	.002917	....	....	
22,000	88,000	.033833	.002583	....	....	
22,500	90,000	.0383	.004467	....	....	
23,000	92,000	.0417	.0034	....	....	
23,500	94,000	.0467	.0050	....	....	
24,000	96,000	.0517	.0050	....	....	
24,500	98,000	.0617	.0100	....	....	
25,000	100,000	.0717	.0100	....	....	
25,520	102,080	.1117	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102,080
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch..	0.1533
Elongation per inch under strain at elastic limit	do....	.001783
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.40 from neck
Character of surface		silky; trace of granulation
Elongation of inch sections		″.08, ″.08, ″.11, ″.15, ″.33*, ″.17

HOOP A$_3$.

Exterior diameter, 36''.75.
Interior diameter, 30''.25.

No. 2866.

Marks, $^{12}\mathrm{M}\,\frac{\mathrm{R}_1}{\mathrm{T}_1\,\mathrm{M}}\,\mathrm{A}_3$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001183	.000183	0.	....	
10,000	40,000	.001350	.000167	0.	....	
11,250	45,000	.001533	.000183	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001750	.000050	....	....	
13,000	52,000	.001783	.000033	....	....	
13,250	53,000	.001817	.000034	....	....	
13,500	54,000	.001867	.000050	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001950	.000050	....	....	
14,250	57,000	.001983	.000033	....	....	
14,500	58,000	.002017	.000034	....	....	
14,750	59,000	.002050	.000033	....	....	
15,000	60,000	.002083	.000033	....	....	
15,250	61,000	.002117	.000034	....	....	
15,500	62,000	.002150	.000033	....	....	
15,750	63,000	.002200	.000050	....	....	Elastic limit.
16,000	64,000	.002750	.000550	....	....	
16,250	65,000	.003533	.000783	....	....	
16,500	66,000	.005000	.001467	....	....	
17,000	68,000	.006833	.001833	....	....	
17,500	70,000	.008500	.001667	....	....	
18,000	72,000	.010000	.001500	....	....	
18,500	74,000	.011500	.001500	....	....	
19,000	76,000	.013117	.001617	....	....	
19,500	78,000	.014667	.001550	....	....	
20,000	80,000	.016167	.001500	....	....	
20,500	82,000	.017783	.001616	....	....	
21,000	84,000	.019667	.001884	....	....	
21,500	86,000	.021500	.001833	....	....	
22,000	88,000	.023750	.002250	....	....	
22,500	90,000	.025900	.002150	....	....	
23,000	92,000	.027500	.001600	....	....	
23,500	94,000	.0300	.0025	....	....	
24,000	96,000	.0333	.0033	....	....	
24,500	98,000	.0367	.0034	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0450	.0050	....	....	
26,000	104,000	.0517	.0067	....	....	
26,500	106,000	.0567	.0050	....	....	
27,000	108,000	.0667	.0100	....	....	
27,500	110,000	.0933	.0266	....	....	
27,540	110,160	.1050	.0117	....	....	Tensile strength.

General summary.

Specific gravity	7.8804
Hardness	25.43
Tensile strength per square inch of original section .... pounds..	110,160
Elastic limit per square inch of original section .... do....	63,000
Elongation per inch after rupture .... inch..	0.1400
Elongation per inch under strain at elastic limit .... do....	.002200
Reduction in diameter at point of rupture .... do....	.144
Reduction in area after rupture, per centum of original section	44.6
Position of rupture	3 inches from neck
Character of broken surface	silky
Elongation of inch sections	".07, ".12, ".25, ".12, ".10, ".07

No. 2867.

Marks, $^{12}\genfrac{}{}{0pt}{}{M\ B_1\ A_8}{T_2\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
13,750	55,000	.001817	.000167	....	....	
14,000	56,000	.001850	.000033	....	....	
14,250	57,000	.001883	.000033	....	....	
14,500	58,000	.001933	.000050	....	....	
14,750	59,000	.001967	.000034	....	....	
15,000	60,000	.002000	.000033	....	....	
15,250	61,000	.002033	.000033	....	....	
15,500	62,000	.002067	.000034	....	....	
15,750	63,000	.002100	.000033	....	....	
16,000	64,000	.002133	.000033	....	....	
16,250	65,000	.002167	.000034	....	....	
16,500	66,000	.002200	.000033	....	....	
16,750	67,000	.002250	.000050	....	....	Elastic limit.
17,000	68,000	.002333	.000083	....	....	
17,250	69,000	.002433	.000100	....	....	
17,500	70,000	.002917	.000484	....	....	
18,000	72,000	.004183	.001266	....	....	
18,500	74,000	.006000	.001817	....	....	
19,000	76,000	.007567	.001567	....	....	
19,500	78,000	.009333	.001766	....	....	
20,000	80,000	.010667	.001334	....	....	
20,500	82,000	.012300	.001633	....	....	
21,000	84,000	.013750	.001450	....	....	
21,500	86,000	.015500	.001750	....	....	
22,000	88,000	.017333	.001833	....	....	
22,500	90,000	.018933	.001600	....	....	
23,000	92,000	.020833	.001900	....	....	
23,500	94,000	.022750	.001917	....	....	
24,000	96,000	.024500	.001750	....	....	
24,500	98,000	.027000	.002500	....	....	
25,000	100,000	.0283	.0013	....	....	
25,500	102,000	.0317	.0034	....	....	
26,000	104,000	.0367	.0050	....	....	
26,500	106,000	.0383	.0016	....	....	
27,000	108,000	.0433	.0050	....	....	
27,500	110,000	.0483	.0050	....	....	
28.000	112,000	.0533	.0050	....	....	
28,500	114,000	.0633	.0100	....	....	
29,000	116,000	.0817	.0184	....	....	
29,060	116,240	.0933	.0116	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	116,240
Elastic limit per square inch of original section	do....	67,000
Elongation per inch after rupture	inch..	0.1217
Elongation per inch under strain at elastic limit	do ...	.002250
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		2″ 20 from neck
Character of broken surface		silky, trace of granulation
Elongation of inch sections		″.05, ″.07, ″.09, ″.17, ″.25*, ″.10

No. 2868.

Marks, $^{12}\frac{\text{M R}_1\text{ A}_8}{\text{T}_3\text{ M}}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000467	.000184	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001333	.000183	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001717	.000017	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001833	.000050	....	....	
14,000	56,000	.001883	.000050	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001967	.000050	....	....	Elastic limit.
14,750	59,000	.002067	.000100	....	....	
15,000	60,000	.002367	.000300	....	....	
15,250	61,000	.003017	.000650	....	....	
15,500	62,000	.004083	.001066	....	....	
16,000	64,000	.005933	.001850	....	....	
16,500	66,000	.007833	.001900	....	....	
17,000	68,000	.009500	.001667	....	....	
17,500	70,000	.011133	.001633	....	....	
18,000	72,000	.012750	.001617	....	....	
18,500	74,000	.014500	.001750	....	....	
19,000	76,000	.016333	.001833	....	....	
19,500	78,000	.018183	.001850	....	....	
20,000	80,000	.020250	.002067	....	....	
20,500	82,000	.022500	.002250	....	....	
21,000	84,000	.024583	.002083	....	....	
21,500	86,000	.027500	.002917	....	....	
22,000	88,000	.029833	.002333	....	....	
22,500	90,000	.0333	.003467	....	....	
23,000	92,000	.0367	.0034	....	....	
23,500	94,000	.0400	.0033	....	....	
24,000	96,000	.0450	.0050	....	....	
24,500	98,000	.0517	.0067	....	....	
25,000	100,000	.0567	.0050	....	....	
25,500	102,000	.0700	.0133	....	....	
26,000	104,000	.0900	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 104,000
Elastic limit per square inch of original section .... do.... 58,000
Elongation per inch after rupture .... inch.. 0.1433
Elongation per inch under strain at elastic limit .... do.... .001967
Reduction in diameter at point of rupture .... do.... .154
Reduction in area after rupture, per centum of original section 47.2
Position of rupture .... 1".8 from neck
Character of broken surface .... silky
Elongation of inch sections .... ".11, ".36, ".12, ".10, ".09, ".[illegible]

No. 2869.

Marks, $^{12\,\mathrm{M\,R,\,A_3}}_{\mathrm{T_4\,I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001817	.000050	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	
14,250	57,000	.001917	.000034	....	....	
14,500	58,000	.001950	.000033	....	....	
14,750	59,000	.002000	.000050	....	....	
15,000	60,000	.002050	.000050	....	....	
15,250	61,000	.002100	.000050	....	....	
15,500	62,000	.002133	.000033	....	....	
15,750	63,000	.002167	.000034	....	....	
16,000	64,000	.002200	.000033	....	....	Elastic limit.
16,250	65,000	.002300	.000100	....	....	
16,500	66,000	.002400	.000100	....	....	
16,750	67,000	.002550	.000150	....	....	
17,000	68,000	.002967	.000417	....	....	
17,500	70,000	.004783	.001816	....	....	
18,000	72,000	.006667	.001884	....	....	
18,500	74,000	.008300	.001633	....	....	
19,000	76,000	.009883	.001583	....	....	
19,500	78,000	.011500	.001617	....	....	
20,000	80,000	.013117	.001617	....	....	
20,500	82,000	.014750	.001633	....	....	
21,000	84,000	.016500	.001750	....	....	
21,500	86,000	.018350	.001850	....	....	
22,000	88,000	.020283	.001933	....	....	
22,500	90,000	.022333	.002050	....	....	
23,000	92,000	.024833	.002500	....	....	
23,500	94,000	.026867	.002034	....	....	
24,000	96,000	.029500	.002633	....	....	
24,500	98,000	.031883	.002383	....	....	
25,000	100,000	.034167	.002284	....	....	
25,500	102,000	.0367	.002533	....	....	
26,000	104,000	.0433	.0066	....	....	
26,500	106,000	.0500	.0067	....	....	
27,000	108,000	.0550	.0050	....	....	
27,500	110,000	.0650	.0100	....	....	
27,890	111,560	.0917	.0267	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,560
Elastic limit per square inch of original section	do....	64,000
Elongation per inch after rupture	inch..	0.1300
Elongation per inch under strain at elastic limit	do....	.002200
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.65 from neck
Character of broken surface		silky; slightly granular
Elongation of inch sections		″.11, ″.32*, ″.12, ″.09, ″.07, ″.07

No. 716.

Marks, $\underset{\mathrm{M\,R_1}}{12\,\mathrm{M\,R_1}\;\mathrm{T\,R_1}}$
Length, 11″.020.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050			
3,000	3,000	.000100	.000050			
4,000	4,000	.000140	.000040			
5,000	5,000	.000190	.000050	0.		
6,000	6,000	.000240	.000050			
7,000	7,000	.000280	.000040			
8,000	8,000	.000330	.000050			
9,000	9,000	.000380	.000050			
10,000	10,000	.000430	.000050	.000020	.000020	
11,000	11,000	.000470	.000040			
12,000	12,000	.000520	.000050			
13,000	13,000	.000570	.000050			
14,000	14,000	.000620	.000050			
15,000	15,000	.000670	.000050	.000030	.000010	
16,000	16,000	.000720	.000050			
17,000	17,000	.000770	.000050			
18,000	18,000	.000820	.000050			
19,000	19,000	.000880	.000060			
20,000	20,000	.000920	.000040	.000080	.000050	
21,000	21,000	.000990	.000070			
22,000	22,000	.001060	.000070			
23,000	23,000	.001120	.000060			
24,000	24,000	.001180	.000060			
25,000	25,000	.001270	.000090	.000180	.000100	
26,000	26,000	.001340	.000070			
27,000	27,000	.001420	.000080			
28,000	28,000	.001510	.000090			
29,000	29,000	.001610	.000100			
30,000	30,000	.001720	.000110	.000380	.000200	
31,000	31,000	.001870	.000150			
32,000	32,000	.001980	.000110			
33,000	33,000	.002150	.000170			
34,000	34,000	.002360	.000210			
35,000	35,000	.002620	.000260	.001010	.000630	
36,000	36,000	.002920	.000300			
37,000	37,000	.003160	.000240			
38,000	38,000	.003510	.000350			
39,000	39,000	.003850	.000340			
40,000	40,000	.004400	.000550	.002520	.001510	
57,300	57,300					Ultimate strength.

Failed by triple flexure.

No. 2875.

Marks, $^{12\,M\,R_1\,A_4}_{\quad T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000800	.000183	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
11,250	45,000	.001467	.000150	....	....	
12,500	50,000	.001650	.000183	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001933	.000033	....	....	
14,750	59,000	.001983	.000050	....	....	
15,000	60,000	.002033	.000050	....	....	
15,250	61,000	.002050	.000017	....	....	
15,500	62,000	.002083	.000033	....	....	
15,750	63,000	.002117	.000034	....	....	
16,000	64,000	.002167	.000050	....	....	Elastic limit.
16,250	65,000	.003417	.001250	....	....	
16,500	66,000	.004850	.001433	....	....	
17,000	68,000	.006700	.001850	....	....	
17,500	70,000	.008167	.001467	....	....	
18,000	72,000	.009667	.001500	....	....	
18,500	74,000	.011000	.001333	....	....	
19,000	76,000	.012500	.001500	....	....	
19,500	78,000	.014167	.001667	....	....	
20,000	80,000	.015667	.001500	....	....	
20,500	82,000	.017183	.001516	....	....	
21,000	84,000	.018800	.001617	....	....	
21,500	86,000	.020667	.001867	....	....	
22,000	88,600	.022500	.001833	....	....	
22,500	90,000	.024667	.002167	....	....	
23,000	92,000	.026750	.002083	....	....	
23,500	94,000	.029333	.002583	....	....	
24,000	96,000	.031667	.002334	....	....	
24,500	98,000	.0350	.003333	....	....	
25,000	100,000	.0383	.0033	....	....	
25,500	102,000	.0417	.0034	....	....	
26,000	104,000	.0467	.0050	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0617	.0100	....	....	
27,500	110,000	.0733	.0116	....	....	
27,780	111,120	.0983	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 111,120
Elastic limit per square inch of original section..................................do.... 64,000
Elongation per inch after rupture..................................inch.. 0.1333
Elongation per inch under strain at elastic limit..................................do.... .002167
Reduction in diameter at point of rupture..................................do.... .144
Reduction in area after rupture, per centum of original section.................................. 44.6
Position of rupture..................................2″.90 from neck
Character of broken surface..................................silky
Elongation of inch sections.................................. ″.06, ″.08, ″.13, ″.32*, ″.12, ″.09

No. 2876.

Marks, $^{12}\frac{\text{M}}{\text{T}_5}\frac{\text{E}_1}{\text{M}}\text{A}_4$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001483	.000183	....	....	
12, 500	50, 000	.001667	.000184	....	....	
12, 750	51, 000	.001683	.000016	....	....	
13, 000	52, 000	.001717	.000034	....	....	
13, 250	53, 000	.001750	.000033	....	....	
13, 500	54, 000	.001783	.000033	....	....	
13, 750	55, 000	.001833	.000050	....	....	
14, 000	56, 000	.001867	.000034	....	....	
14, 250	57, 000	.001900	.000033	....	....	
14, 500	58, 000	.001933	.000033	....	....	Elastic limit.
14, 750	59, 000	.002067	.000134	....	....	
15, 000	60, 000	.002367	.000300	....	....	
15, 250	61, 000	.005000	.002633	....	....	
15, 500	62, 000	.006833	.001833	....	....	
16, 000	64, 000	.008050	.001217	....	....	
16, 500	66, 000	.009667	.001617	....	....	
17, 000	68, 000	.011250	.001583	....	....	
17, 500	70, 000	.012667	.001417	....	....	
18, 000	72, 000	.014250	.001583	....	....	
18, 500	74, 000	.016000	.001750	....	....	
19, 000	76, 000	.017667	.001667	....	....	
19, 500	78, 000	.019667	.002000	....	....	
20, 000	80, 000	.021583	.001916	....	....	
20, 500	82, 000	.023417	.001834	....	....	
21, 000	84, 000	.025833	.002416	....	....	
21, 500	86, 000	.0283	.002467	....	....	
22, 000	88, 000	.0317	.0034	....	....	
22, 500	90, 000	.0350	.0033	....	....	
23, 000	92, 000	.0367	.0017	....	....	
23, 500	94, 000	.0400	.0033	....	....	
24, 000	96, 000	.0467	.0067	....	....	
24, 500	98, 000	.0517	.0050	....	....	
25, 000	100, 000	.0583	.0066	....	....	
25, 500	102, 000	.0683	.0100	....	....	
26, 000	104, 000	.0883	.0200	....	....	
26, 130	104, 520	.1133	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..pounds.. 104,520
Elastic limit per square inch of original section..do.... 58,000
Elongation per inch after rupture..inch.. 0.1517
Elongation per inch under strain at elastic limit..do.... .001933
Reduction in diameter at point of rupture..do.... .154
Reduction in area after rupture, per centum of original section.......................... 47.2
Position of rupture..2″.15 from neck
Character of broken surface..silky
Elongation of inch sections..″.11, ″.31*, ″.18, ″.12, ″.10, ″.[illegible]

No. 2877.

Marks, $\overset{12\,\text{M R}_{1}\,\text{A}_{4}}{\text{T}_{4}\,\text{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000133	. 000133	0.	....	
2, 500	10, 000	. 000300	. 000167	0.	....	
3, 750	15, 000	. 000467	. 000167	0.	....	
5, 000	20, 000	. 000633	. 000166	0.	....	
6, 250	25, 000	. 000800	. 000167	0.	....	
7, 500	30, 000	. 000967	. 000167	0.	....	
8, 750	35, 000	. 001133	. 000166	0.	....	
10, 000	40, 000	. 001300	. 000167	0.	....	
11, 250	45, 000	. 001483	. 000183	....	....	
12, 500	50, 000	. 001667	. 000184	....	....	
12, 750	51, 000	. 001700	. 000033	....	....	
13, 000	52, 000	. 001733	. 000033	....	....	
13, 250	53, 000	. 001783	. 000050	....	....	
13. 500	54, 000	. 001817	. 000034	....	....	
13, 750	55, 000	. 001867	. 000050	....	....	
14, 000	56, 000	. 001900	. 000033	....	....	
14, 250	57, 000	. 001933	. 000033	....	....	
14, 500	58, 000	. 001983	. 000050	....	....	Elastic limit.
14. 750	59, 000	. 007783	. 005800	....	....	
15, 000	60, 000	. 008500	. 000717	....	....	
15. 500	62, 000	. 010167	. 001667	....	....	
16, 000	64, 000	. 011767	. 001600	....	....	
16, 500	66, 000	. 013417	. 001650	....	....	
17, 000	68, 000	. 015283	. 001866	....	....	
17, 500	70, 000	. 017000	. 001717	....	....	
18, 000	72, 000	. 019017	. 002017	....	....	
18, 500	74, 000	. 020967	. 001950	....	....	
19, 000	76, 000	. 023000	. 002033	....	....	
19. 500	78, 000	. 025667	. 002667	....	....	
20, 000	80, 000	. 027833	. 002166	....	....	
20, 500	82, 000	. 030500	. 002667	....	....	
21, 000	84, 000	. 034167	. 003667	....	....	
21, 500	86, 000	. 0367	. 002533	....	....	
22, 000	88, 000	. 0417	. 0050	....	....	
22, 500	90. 000	. 0467	. 0050	....	....	
23, 000	92, 000	. 0533	. 0066	....	....	
23, 500	94, 000	. 0600	. 0067	....	....	
24, 000	96, 000	. 0700	. 0100	....	....	
24, 500	98, 000	. 0933	. 0233	....	....	
24, 650	98, 600	. 1150	. 0217	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	98, 600
Elastic limit per square inch of original section	do....	58, 000
Elongation per inch after rupture	inch..	0. 1567
Elongation per inch under strain at elastic limit	do....	. 001983
Reduction in diameter at point of rupture	do....	. 164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		3″.25 from neck
Character of broken surface		silky
Elongation of inch sections		″.08, ″.11, ″.37*, ″.17, ″.12, ″.09

HOOP A_3.

Exterior diameter, 36″.75.
Interior diameter, 30″.125.

No. 2982.

Marks, $^{12\,\mathrm{M\,R,\,A_3}}_{\mathrm{T,\,M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000500	.000183	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000850	.000183	0.	....	
7,500	30,000	.001033	.000183	0.	....	
8,750	35,000	.001167	.000134	0.	....	
10,000	40,000	.001350	.000183	0.000017	.000017	
11,250	45,000	.001517	.000167	....	....	
12,500	50,000	.001700	.000183	....	....	
12,750	51,000	.001750	.000050	....	....	
13,000	52,000	.001800	.000050	....	....	
13,250	53,000	.001833	.000033	....	....	Elastic limit.
13,500	54,000	.001933	.000100	....	....	
13,750	55,000	.002183	.000250	....	....	
14,000	56,000	.003833	.001650	....	....	
14,250	57,000	.004867	.001034	....	....	
14,500	58,000	.005833	.000966	....	....	
14,750	59,000	.006667	.000834	....	....	
15,000	60,000	.007833	.001166	....	....	
15,500	62,000	.009500	.001667	....	....	
16,000	64,000	.011083	.001583	....	....	
16,500	66,000	.013300	.002217	....	....	
17,000	68,000	.014917	.001617	....	....	
17,500	70,000	.016717	.001800	....	....	
18,000	72,000	.019000	.002283	....	....	
18,500	74,000	.021083	.002083	....	....	
19,000	76,000	.023333	.002250	....	....	
19,500	78,000	.025667	.002334	....	....	
20,000	80,000	.028333	.002666	....	....	
20,500	82,000	.031500	.003167	....	....	
21,000	84,000	.035000	.003500	....	....	
21,500	86,000	.0383	.0033	....	....	
22,000	88,000	.0467	.0084	....	....	
22,500	90,000	.0517	.0050	....	....	
23,000	92,000	.0567	.0050	....	....	
23,500	94,000	.0683	.0116	....	....	
24,000	96,000	.0850	.0167	....	....	
24,280	97,120	.1267	.0417	....	....	Tensile strength.

General summary.

Specific gravity		7.8486
Hardness		20.25
Tensile strength per square inch of original section	pounds..	97,120
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1750
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		3″.25 from neck
Character of broken surface		silky
Elongation of inch sections		″.09, ″.13, ″.30*, ″.21, ″.13, ″.10

No. 2983.

Marks, $\frac{12\text{ M R, A}}{\text{T, O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000483	.000150	—.000017	—.000047	
5, 000	20, 000	.000633	.000150	—.000033	—.000016	
6, 250	25, 000	.000800	.000167	—.000033	0.	
7, 500	30, 000	.000967	.000167	—.000033	0.	
8, 750	35, 000	.001133	.000166	—.000033	0.	
10, 000	40, 000	.001300	.000167	—.000033	0.	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001650	.000183	....	....	
12, 750	51, 000	.001667	.000017	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001733	.000033	....	....	
13, 500	54, 000	.001783	.000050	....	....	
13, 750	55, 000	.001833	.000050	....	....	
14, 000	56, 000	.001867	.000034	....	....	
14, 250	57, 000	.001900	.000033	....	....	
14, 500	58, 000	.001967	.000067	....	....	
14, 750	59, 000	.002000	.000033	....	....	Elastic limit.
15, 000	60, 000	.002150	.000150	....	....	
15, 250	61, 000	.002833	.000683	....	....	
15, 500	62, 000	.004117	.001284	....	....	
15, 750	63, 000	.005167	.001050	....	....	
16, 000	64, 000	.006333	.001166	....	....	
16, 500	66, 000	.007917	.001584	....	....	
17, 000	68, 000	.009600	.001683	....	....	
17, 500	70, 000	.011350	.001750	....	....	
18, 000	72, 000	.012967	.001617	....	....	
18, 500	74, 000	.014833	.001866	....	....	
19, 000	76, 000	.016417	.001584	....	....	
19, 500	78, 000	.018333	.001916	....	....	
20, 000	80, 000	.020367	.002034	....	....	
20, 500	82, 000	.022500	.002133	....	....	
21, 000	84, 000	.024667	.002167	....	....	
21, 500	86, 000	.027083	.002366	....	....	
22, 000	88, 000	.030000	.002917	....	....	
22, 500	90, 000	.033000	.003000	....	....	
23, 000	92, 000	.036167	.003167	....	....	
23, 500	94, 000	.0417	.005533	....	....	
24, 000	96, 000	.0467	.0050	....	....	
24, 500	98, 000	.0500	.0033	....	....	
25, 000	100, 000	.0583	.0083	....	....	
25, 500	102, 000	.0700	.0117	....	....	
26, 000	104, 000	.0917	.0217	....	....	
26, 120	104, 480	.1083	.0166	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	104, 480
Elastic limit per square inch of original section	do ...	59, 000
Elongation per inch after rupture	inch...	0. 1617
Elongation per inch under strain at elastic limit	do....	.002000
Reduction in diameter at point of rupture	do ...	.164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		1″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.09, ″.10, ″.11, ″16, ″.38*, ″.13

No. 2984.

Marks, $^{12}\frac{\mathrm{M\ R,\ A_s}}{\mathrm{T_s\ M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001700	.000050	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001783	.000050	....	....	
13,500	54,000	.001867	.000084	....	....	
13,750	55,000	.001900	.000033	....	....	Elastic limit.
14,000	56,000	.002633	.000733	....	....	
14,250	57,000	.003667	.001034	....	....	
14,500	58,000	.005000	.001333	....	....	
14,750	59,000	.005833	.000833	....	....	
15,000	60,000	.006667	.000834	....	....	
15,500	62,000	.008583	.001916	....	....	
16,000	64,000	.010417	.001834	....	....	
16,500	66,000	.012083	.001666	....	....	
17,000	68,000	.013667	.001584	....	....	
17,500	70,000	.015467	.001800	....	....	
18,000	72,000	.017333	.001866	....	....	
18,500	74,000	.019333	.002000	....	....	
19,000	76,000	.021333	.002000	....	....	
19,500	78,000	.023667	.002334	....	....	
20,000	80,000	.026250	.002583	....	....	
20,500	82,000	.028667	.002417	....	....	
21,000	84,000	.031667	.003000	....	....	
21,500	86,000	.035333	.003666	....	....	
22,000	88,000	.039167	.003834	....	....	
22,500	90,000	.0450	.005833	....	....	
23,000	92,000	.0517	.0067	....	....	
23,500	94,000	.0567	.0050	....	....	
24,000	96,000	.0667	.0100	....	....	
24,500	98,000	.0850	.0183	....	....	
24,640	98,560	.1083	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section............pounds.. 98,560
Elastic limit per square inch of original section............do.... 55,000
Elongation per inch after rupture............inch.. 0.1717
Elongation per inch under strain at elastic limit............do.... .001900
Reduction in diameter at point of rupture............do.... .164
Reduction in area after rupture, per centum of original section............ 49.7
Position of rupture............2″.50 from neck
Character of broken surface............silky
Elongation of inch sections............″.11, ″.21, ″.33*, ″.17, ″.12, ″.09

No. 2985.

Marks, $\frac{12\ \mathrm{M}\ \mathrm{R}_1\ \mathrm{A}_8}{\mathrm{T}_4\ \mathrm{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000317	.000167	0.		
3,750	15,000	.000500	.000183	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001017	.000184	.000017	.000017	
8,750	35,000	.001183	.000166	.000017	0.	
10,000	40,000	.001367	.000184	.000033	.000016	
11,250	45,000	.001517	.000150			
12,500	50,000	.001700	.000183			
12,750	51,000	.001733	.000033			
13,000	52,000	.001783	.000050			
13,250	53,000	.001817	.000034			
13,500	54,000	.001867	.000050			
13,750	55,000	.001917	.000050			Elastic limit.
14,000	56,000	.002000	.000083			
14,250	57,000	.002300	.000300			
14,500	58,000	.003333	.001033			
14,750	59,000	.004167	.000834			
15,000	60,000	.005500	.001333			
15,500	62,000	.007500	.002000			
16,000	64,000	.009583	.002083			
16,500	66,000	.011417	.001834			
17,000	68,000	.013667	.002250			
17,500	70,000	.015833	.002166			
18,000	72,000	.017500	.001667			
18,500	74,000	.019833	.002333			
19,000	76,000	.022333	.002500			
19,500	78,000	.024833	.002500			
20,000	80,000	.027500	.002667			
20,500	82,000	.030000	.002500			
21,000	84,000	.033333	.003333			
21,500	86,000	.037167	.003834			
22,000	88,000	.0433	.006133			
22,500	90,000	.0483	.0050			
23,000	92,000	.0550	.0067			
23,500	94,000	.0650	.0100			
24,000	96,000	.0833	.0183			
24,190	96,760	.1067	.0234			Tensile strength.

General summary.

Tensile strength per square inch of original section	**pounds..**	**96,760**
Elastic limit per square inch of original section	**do....**	**55,000**
Elongation per inch after rupture	**inch..**	**0.1600**
Elongation per inch under strain at elastic limit	**do....**	**.001917**
Reduction in diameter at point of rupture	**do....**	**.164**
Reduction in area after rupture, per centum of original section		**49.7**
Position of rupture		**2″.25 from neck**
Character of broken surface		**silky**
Elongation of inch sections		**″.07, ″.09, ″.12, ″.22, ″.35*, ″.11**

HOOP A_4.

Exterior diameter, 37″.125.
Interior diameter, 30″.625.

No. 2986.

Marks, $^{12}\,\frac{M\ R_1\ A_4}{T_1\ M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001767	.000050	....	....	
13,500	54,000	.001817	.000050	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	
14,250	57,000	.001933	.000050	....	....	
14,500	58,000	.001983	.000050	....	....	Elastic limit.
14,750	59,000	.002050	.000067	....	....	
15,000	60,000	.002300	.000250	....	....	
15,250	61,000	.003000	.000700	....	....	
15,500	62,000	.004250	.001250	....	....	
16,000	64,000	.006250	.002000	....	....	
16,500	66,000	.008167	.001917	....	....	
17,000	68,000	.010000	.001833	....	....	
17,500	70,000	.011667	.001667	....	....	
18,000	72,000	.013333	.001666	....	....	
18,500	74,000	.015050	.001717	....	....	
19,000	76,000	.017000	.001950	....	....	
19,500	78,000	.018917	.001917	....	....	
20,000	80,000	.020917	.002000	....	....	
20,500	82,000	.023250	.002333	....	....	
21,000	84,000	.025500	.002250	....	....	
21,500	86,000	.028050	.002550	....	....	
22,000	88,000	.030833	.002783	....	....	
22,500	90,000	.034333	.003500	....	....	
23,000	92,000	.038083	.003750	....	....	
23,500	94,000	.0433	.005217	....	....	
24,000	96,000	.0483	.0050	....	....	
24,500	98,000	.0533	.0050	....	....	
25,000	100,000	.0650	.0117	....	....	
25,500	102,000	.0833	.0183	....	....	
25,750	103,000	.1200	.0367	....	....	Tensile strength.

General summary.

Specific gravity		7.8494
Hardness		21.89
Tensile strength per square inch of original section	pounds	103,000
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1700
Elongation per inch under strain at elastic limit	do	.001983
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.14, ″.37*, ″.15, ″.16, ″.12, ″.08

No. 2987.

Marks, $^{12}\underset{\mathrm{T,\,O}}{\mathrm{M\;R_1}}\;\mathrm{A_4}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000817	.000150	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001817	.000067	....	....	
13,750	55,000	.001850	.000033	....	....	
14,000	56,000	.001883	.000033	....	....	
14,250	57,000	.001933	.000050	....	....	
14,500	58,000	.001983	.000050	....	....	
14,750	59,000	.002017	.000034	....	....	Elastic limit.
15,000	60,000	.002817	.000800	....	....	
15,250	61,000	.003833	.001016	....	....	
15,500	62,000	.005167	.001334	....	....	
16,000	64,000	.007083	.001916	....	....	
16,500	66,000	.009500	.002417	....	....	
17,000	68,000	.011250	.001750	....	....	
17,500	70,000	.012917	.001667	....	....	
18,000	72,000	.014583	.001666	....	....	
18,500	74,000	.016250	.001667	....	....	
19,000	76,000	.017967	.001717	....	....	
19,500	78,000	.020767	.002200	....	....	
20,000	80,000	.022500	.002333	....	....	
20,500	82,000	.024583	.002083	....	....	
21,000	84,000	.027500	.002917	....	....	
21,500	86,000	.030000	.002500	....	....	
22,000	88,000	.033167	.003167	....	....	
22,500	90,000	.036667	.003500	....	....	
23,000	92,000	.041000	.004333	....	....	
23,500	94,000	.0467	.0057	....	....	
24,000	96,000	.0517	.0050	....	....	
24,500	98,000	.0633	.0116	....	....	
25,000	100,000	.0800	.0167	....	....	
25,300	101,200	.1033	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............pounds..	101,200
Elastic limit per square inch of original section..............do....	59,000
Elongation per inch after rupture..............inch..	0.1300
Elongation per inch under strain at elastic limit..............do....	.002017
Reduction in diameter at point of rupture..............do....	.174
Reduction in area after rupture, per centum of original section..............	52.2
Position of rupture..............	2".50 from neck
Character of broken surface..............	silky
Elongation of inch sections..............	".11, ".20, ".34*, ".15, "11, "07

No. 2989.

Marks, $\genfrac{}{}{0pt}{}{12\ \mathrm{M\ R_1\ A_6}}{\mathrm{T_4\ I}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000483	.000150	0.	....	
5, 000	20, 000	.000667	.000184	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 000	.001333	.000166	0.	....	
11, 250	45, 000	.001500	.000167	....	....	
12, 500	50, 000	.001667	.000167	....	....	
12, 750	51, 000	.001683	.000016	....	....	
13, 000	52, 000	.001717	.000034	....	....	
13, 250	53, 000	.001750	.000033	....	....	
13, 500	54, 000	.001783	.000033	....	....	
13, 750	55, 000	.001833	.000050	....	....	
14, 000	56, 000	.001867	.000034	....	....	
14, 250	57, 000	.001900	.000033	....	....	
14, 500	58, 000	.001933	.000033	....	....	
14, 750	59, 000	.001983	.000050	....	....	Elastic limit.
15, 000	60, 000	.002050	.000067	....	....	
15, 250	61, 000	.002200	.000150	....	....	
15, 500	62, 000	.002750	.000550	....	....	
15, 750	63, 000	.003200	.000450	....	....	
16, 000	64, 000	.004217	.001017	....	....	
16, 500	66, 000	.006167	.001950	....	....	
17, 000	68, 000	.007917	.001750	....	....	
17, 500	70, 000	.009667	.001750	....	....	
18, 000	72, 000	.011333	.001666	....	....	
18, 500	74, 000	.013167	.001834	....	....	
19, 000	76, 000	.014667	.001500	....	....	
19, 500	78, 000	.016500	.001833	....	....	
20, 000	80, 000	.018500	.002000	....	....	
20, 500	82, 000	.020333	.001833	....	....	
21, 000	84, 000	.022333	.002000	....	....	
21, 500	86, 000	.024667	.002334	....	....	
22, 000	88, 000	.027167	.002500	....	....	
22, 500	90, 000	.029667	.002500	....	....	
23, 000	92, 000	.032917	.003250	....	....	
23, 500	94, 000	.036500	.003583	....	....	
24, 000	96, 000	.040000	.003500	....	....	
24, 500	98, 000	.0450	.0050	....	....	
25, 000	100, 000	.0517	.0067	....	....	
25, 500	102, 000	.0600	.0083	....	....	
26, 000	104, 000	.0700	.0100	....	....	
26, 390	105, 560	.1000	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	105, 560
Elastic limit per square inch of original section	do ...	59, 000
Elongation per inch after rupture	inch..	0. 1383
Elongation per inch under strain at elastic limit	do	.001983
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		2″.85 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.08, ″.15, ″.33*, ″.12, ″.08, ″.07

HOOP B_1.

Exterior diameter, 42″.50.
Interior diameter, 35″.25.

No. 2974.

Marks, $\frac{12\ M\ B_1\ B_1}{T_1\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000317	.000150	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001017	.000184	0.	....	
8,750	35,000	.001183	.000166	0.	....	
10,000	40,000	.001383	.000200	0.	....	
11,250	45,000	.001517	.000134	....	....	
12,500	50,000	.001717	.000200	....	....	
12,750	51,000	.001750	.000033	....	....	
13,000	52,000	.001783	.000033	....	....	
13,250	53,000	.001800	.000017	....	....	
13,500	54,000	.001833	.000033	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001917	.000050	....	....	
14,250	57,000	.001950	.000033	....	....	
14,500	58,000	.001983	.000038	....	....	
14,750	59,000	.002033	.000050	....	....	
15,000	60,000	.002083	.000050	....	....	
15,250	61,000	.002117	.000034	....	....	
15,500	62,000	.002150	.000033	....	....	Elastic limit.
15,750	63,000	.002233	.000083	....	....	
16,000	64,000	.002300	.000067	....	....	
16,250	65,000	.002383	.000083	....	....	
16,500	66,000	.002617	.000234	....	....	
16,750	67,000	.003117	.000500	....	....	
17,000	68,000	.003850	.000733	....	....	
17,500	70,000	.005350	.001500	....	....	
18,000	72,000	.006500	.001150	....	....	
18,500	74,000	.008017	.001517	....	....	
19,000	76,000	.009333	.001316	....	....	
19,500	78,000	.010717	.001384	....	....	
20,000	80,000	.012200	.001483	....	....	
20,500	82,000	.013533	.001333	....	....	
21,000	84,000	.014933	.001400	....	....	
21,500	86,000	.016583	.001650	....	....	
22,000	88,000	.018200	.001617	....	....	
22,500	90,000	.019833	.001633	....	....	
23,000	92,000	.021600	.001767	....	....	
23,500	94,000	.023533	.001933	....	....	
24,000	96,000	.025583	.002050	....	....	
24,500	98,000	.027667	.002084	....	....	
25,000	100,000	.030333	.002666	....	....	
25,500	102,000	.032500	.002167	....	....	
26,000	104,000	.0350	.0025	....	....	
26,500	106,000	.0367	.0017	....	....	
27,000	108,000	.0417	.0050	....	....	
27,500	110,000	.0467	.0050	....	....	
28,000	112,000	.0533	.0066	....	....	
28,500	114,000	.0600	.0067	....	....	
29,000	116,000	.0700	.0100	....	....	
29,430	117,720	.1033	.0333	....	....	Tensile strength.

General summary.

Specific gravity		7.8470
Hardness		26.35
Tensile strength per square inch of original section	pounds	117,720
Elastic limit per square inch of original section	do	62,000
Elongation per inch after rupture	inch	0.1300
Elongation per inch under strain at elastic limit	do	.002150
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.90 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.09, ″.25*, ″.12, ″.11, ″.10, ″.11

No. 2975.

Marks, $^{12\,M\,R_1\,B_1}_{T_2\,O}$
Diameter ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000333	.000166	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	0.	....	
6, 250	25, 000	.000833	.000166	0.	....	
7, 500	30, 000	.001000	.000167	0.	....	
8, 750	35, 000	.001167	.000167	0.	....	
10, 000	40, 600	.001333	.000166	0.	....	
11, 250	45, 000	.001483	.000150	....	....	
12, 500	50, 000	.001667	.000184	....	....	
12, 750	51, 000	.001700	.000033	....	....	
13, 000	52, 000	.001733	.000033	....	....	
13, 250	53, 000	.001783	.000050	....	....	
13, 500	54, 000	.001817	.000034	....	....	
13, 750	55, 000	.001850	.000033	....	....	
14, 000	56, 000	.001883	.000033	....	....	
14, 250	57, 000	.001917	.000034	....	....	
14, 500	58, 000	.001950	.000033	....	....	
14, 750	59, 000	.001983	.000033	....	....	
15, 000	60, 000	.002033	.000050	....	....	
15, 250	61, 000	.002067	.000034	....	....	
15, 500	62, 000	.002100	.000033	....	....	
15, 750	63, 000	.002150	.000050	....	....	
16, 000	64, 000	.002200	.000050	....	....	Elastic limit.
16, 250	65, 000	.002283	.000083	....	....	
16, 500	66, 000	.004500	.002217	....	....	
17, 000	68, 000	.006167	.001667	....	....	
17, 500	70, 000	.007500	.001333	....	....	
18, 000	72, 000	.009117	.001617	....	....	
18, 500	74, 000	.010700	.001583	....	....	
19, 000	76, 000	.012283	.001583	....	....	
19, 500	78, 000	.013750	.001467	....	....	
20, 000	80, 000	.015417	.001667	....	....	
20, 500	82, 000	.017267	.001850	....	....	
21, 000	84, 000	.019033	.001766	....	....	
21, 500	86, 000	.020667	.001634	....	....	
22, 000	88, 000	.022600	.001933	....	....	
22, 500	90, 000	.024833	.002233	....	....	
23, 000	92, 000	.027000	.002167	....	....	
23, 500	94, 000	.029917	.002917	....	....	
24, 000	96, 000	.032333	.002416	....	....	
24, 500	98, 000	.0350	.002667	....	....	
25, 000	100, 000	.0367	.0017	....	....	
25, 500	102, 000	.0400	.0033	....	....	
26, 000	104, 000	.0467	.0067	....	....	
26, 500	106, 000	.0533	.0066	....	....	
27, 000	108, 000	.0617	.0084	....	....	
27, 500	110, 000	.0750	.0033	....	....	
27, 860	111, 440	.1033	.0283	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 111, 440
Elastic limit per square inch of original section ....do.... 64, 000
Elongation per inch after rupture ....inch.. 0. 1467
Elongation per inch under strain at elastic limit ....do.... .002200
Reduction in diameter at point of rupture ....do ... .144
Reduction in area after rupture, per centum of original section.................................. 44. 6
Position of rupture ....2″.55 from neck
Character of broken surface ....silky; trace of granulation
Elongation of inch sections ....″.07, ″.10, ″.13, ″.33*, ″.15, ″10

No. 2976.

Marks, ${}^{12\text{ M B, B}_1}_{\text{T, M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000183	0.	....	
3,750	15,000	.000483	.000150	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001017	.000184	0.	....	
8,750	35,000	.001183	.000166	0.	....	
10,000	40,000	.001350	.000167	.000017	.000017	
11,250	45,000	.001533	.000183	....	....	
12,500	50,000	.001683	.000150	....	....	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001850	.000050	....	....	
13,750	55,000	.001883	.000033	....	....	
14,000	56,000	.001917	.000034	....	....	
14,250	57,000	.001950	.000033	....	....	
14,500	58,000	.001983	.000033	....	....	
14,750	59,000	.002033	.000050	....	....	
15,000	60,000	.002083	.000050	....	....	
15,250	61,000	.002117	.000034	....	....	
15,500	62,000	.002167	.000050	....	....	
15,750	63,000	.002217	.000050	....	....	
16,000	64,000	.002250	.000033	....	....	Elastic limit.
16,250	65,000	.002383	.000133	....	....	
16,500	66,000	.003050	.000667	....	....	
17,000	68,000	.004283	.001233	....	....	
17,500	70,000	.005667	.001384	....	....	
18,000	72,000	.007167	.001500	....	....	
18,500	74,000	.008433	.001266	....	....	
19,000	76,000	.010000	.001567	....	....	
19,500	78,000	.011333	.001333	....	....	
20,000	80,000	.012717	.001384	....	....	
20,500	82,000	.014250	.001533	....	....	
21,000	84,000	.015733	.001483	....	....	
21,500	86,000	.017383	.001650	....	....	
22,000	88,000	.019000	.001617	....	....	
22,500	90,000	.020883	.001883	....	....	
23,000	92,000	.022717	.001834	....	....	
23,500	94,000	.024633	.001916	....	....	
24,000	96,000	.026750	.002117	....	....	
24,500	98,000	.029050	.002300	....	....	
25,000	100,000	.031667	.002617	....	....	
25,500	102,000	.034250	.002583	....	....	
26,000	104,000	.0367	.002450	....	....	
26,500	106,000	.0417	.0050	....	....	
27,000	108,000	.0467	.0050	....	....	
27,500	110,000	.0500	.0033	....	....	
28,000	112,000	.0567	.0067	....	....	
28,500	114,000	.0667	.0100	....	....	
29,000	116,000	.0850	.0183	....	....	
29,100	116,400	.1033	.0183	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	116,400
Elastic limit per square inch of original section	do	64,000
Elongation per inch after rupture	inch	0.1317
Elongation per inch under strain at elastic limit	do	.002250
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		2.″85 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		″.07, ″.10, ″.28*, ″.13, ″.12, ″.09

No. 2977.

Marks, $^{12}\mathrm{M}\,\frac{\mathrm{B_1}}{\mathrm{T_4}}\frac{\mathrm{B_1}}{\mathrm{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	.000017	.000017	
11,250	45,000	.001517	.000167	....	....	
12,500	50,000	.001683	.000166	....	....	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001750	.000033	....	....	
13,250	53,000	.001783	.000033	....	....	
13,500	54,000	.001833	.000050	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001917	.000050	....	....	
14,250	57,000	.001950	.000033	....	....	
14,500	58,000	.001983	.000033	....	....	
14,750	59,000	.002033	.000050	....	....	
15,000	60,000	.002083	.000050	....	....	
15,250	61,000	.002117	.000034	....	....	
15,500	62,000	.002133	.000016	....	....	
15,750	63,000	.002167	.000034	....	....	
16,000	64,000	.002217	.000050	....	....	
16,250	65,000	.002250	.000033	....	....	Elastic limit.
16,500	66,000	.002333	.000083	....	....	
16,750	67,000	.002450	.000117	....	....	
17,000	68,000	.002783	.000333	....	....	
17,500	70,000	.004200	.001417	....	....	
18,000	72,000	.005933	.001733	....	....	
18,500	74,000	.007583	.001650	....	....	
19,000	76,000	.009417	.001834	....	....	
19,500	78,000	.010917	.001500	....	....	
20,000	80,000	.012433	.001516	....	....	
20,500	82,000	.014167	.001734	....	....	
21,000	84,000	.015750	.001583	....	....	
21,500	86,000	.017467	.001717	....	....	
22,000	88,000	.019100	.001633	....	....	
22,500	90,000	.021333	.002233	....	....	
23,000	92,000	.023417	.002084	....	....	
23,500	94,000	.025583	.002166	....	....	
24,000	96,000	.028000	.002417	....	....	
24,500	98,000	.030500	.002500	....	....	
25,000	100,000	.033667	.003167	....	....	
25,500	102,000	.0350	.001333	....	....	
26,000	104,000	.0383	.0033	....	....	
26,500	106,000	.0450	.0067	....	....	
27,000	108,000	.0500	.0050	....	....	
27,500	110,000	.0567	.0067	....	....	
28,000	112,000	.0667	.0100	....	....	
28,500	114,000	.0883	.0116	....	....	
28,600	114,400	.1050	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	114,400
Elastic limit per square inch of original section	do....	65,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.002250
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.95 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		″.08, ″.09, ″.10, ″11, ″.14, ″.28

HOOP B$_3$.

Exterior diameter, 43″.50.
Interior diameter, 35″.25.

No. 2978.

Marks, ^{12}M R$_1$ B$_3$. T$_1$ M.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001850	.000050	....	....	
14,000	56,000	.001883	.000033	....	....	Elastic limit.
14,250	57,000	.002000	.000117	....	....	
14,500	58,000	.004583	.002583	....	....	
14,750	59,000	.004967	.000384	....	....	
15,000	60,000	.005667	.000700	....	....	
15,500	62,000	.007000	.001333	....	....	
16,000	64,000	.008283	.001283	....	....	
16,500	66,000	.009750	.001467	....	....	
17,000	68,000	.011117	.001367	....	....	
17,500	70,000	.012667	.001550	....	....	
18,000	72,000	.014083	.001416	....	....	
18,500	74,000	.015667	.001584	....	....	
19,000	76,000	.017417	.001750	....	....	
19,500	78,000	.019100	.001683	....	....	
20,000	80,000	.020833	.001733	....	....	
20,500	82,000	.022683	.001850	....	....	
21,000	84,000	.024750	.002067	....	....	
21,500	86,000	.027167	.002417	....	....	
22,000	88,000	.029667	.002500	....	....	
22,500	90,000	.032333	.002666	....	....	
23,000	92,000	.034833	.002500	....	....	
23,500	94,000	.0383	.003467	....	....	
24,000	96,000	.0433	.0050	....	....	
24,500	98,000	.0467	.0034	....	....	
25,000	100,000	.0517	.0050	....	....	
25,500	102,000	.0600	.0083	....	....	
26,000	104,000	.0683	.0083	....	....	
26,500	106,000	.0817	.0134	....	....	
26,760	107,040	.1117	.0300	....	....	Tensile strength.

General summary.

Specific gravity		7.8497
Hardness		21.40
Tensile strength per square inch of original section	pounds	107,040
Elastic limit per square inch of original section	do	56,000
Elongation per inch after rupture	inch	0.1517
Elongation per inch under strain at elastic limit	do	.001883
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.75 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.08, ″.11, ″.12, ″.13, ″.33*, ″.14

No. 2979.

Marks, $\substack{12\,M\,B_1\,B_3 \\ T_3\,O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.		
2, 500	10, 000	.000300	.000167	0.		
3, 750	15, 000	.000483	.000183	0.		
5, 000	20, 000	.000650	.000167	0.		
6, 250	25, 000	.000833	.000183	0.		
7, 500	30, 000	.001017	.000184	0.		
8, 750	35, 000	.001183	.000166	0.		
10, 000	40, 000	.001350	.000167	0.		
11, 250	45, 000	.001517	.000167			
12, 500	50, 000	.001667	.000150			
12, 750	51, 000	.001700	.000033			
13, 000	52, 000	.001733	.000033			
13, 250	53, 000	.001783	.000050			
13, 500	54, 000	.001817	.000034			
13, 750	55, 000	.001850	.000033			
14, 000	56, 000	.001900	.000050			
14, 250	57, 000	.001950	.000050			
14, 500	58, 000	.001983	.000033			
14, 750	59, 000	.002017	.000034			
15, 000	60, 000	.002050	.000033			
15, 250	61, 000	.002100	.000050			
15, 500	62, 000	.002133	.000033			
15, 750	63, 000	.002183	.000050			Elastic limit.
16, 000	64, 000	.003083	.000900			
16, 250	65, 000	.003667	.000584			
16, 500	66, 000	.004333	.000666			
17, 000	68, 000	.005500	.001167			
17, 500	70, 000	.006917	.001417			
18, 000	72, 000	.008167	.001250			
18, 500	74, 000	.009700	.001533			
19, 000	76, 000	.011083	.001383			
19, 500	78, 000	.012333	.001250			
20, 000	80, 000	.013750	.001417			
20, 500	82, 000	.015200	.001450			
21, 000	84, 000	.016917	.001717			
21, 500	86, 000	.018417	.001500			
22, 000	88, 000	.020083	.001666			
22, 500	90, 000	.022000	.001917			
23, 000	92, 000	.024167	.002167			
23, 500	94, 000	.025833	.001666			
24. 000	96, 000	.027917	.002084			
24, 500	98, 000	.030333	.002416			
25, 000	100, 000	.032917	.002584			
25, 500	102, 000	.035833	.002916			
26, 000	104, 000	.0383	.002467			
26, 500	106, 000	.0433	.0050			
27, 000	108, 000	.0483	.0050			
27, 500	110, 000	.0533	.0050			
28, 000	112, 000	.0600	.0067			
28, 500	114, 000	.0717	.0117			
28, 970	115, 880	.1017	.0300			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	115, 880
Elastic limit per square inch of original section	do ...	63, 000
Elongation per inch after rupture	inch..	0. 1367
Elongation per inch under strain at elastic limit	do....	.002183
Reduction in diameter at point of rupture	do ...	.114
Reduction in area after rupture, per centum of original section		36. 4
Position of rupture		2″.75 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.07, ″.10, ″.13, ″.29*, ″.13, ″.10

No. 2980.

Marks, $^{12}\overset{M\ R,\ B_3}{T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	.000017	.000017	
11,250	45,000	.001500	.000150	....	....	
12,500	50,000	.001683	.000183	....	....	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001833	.000033	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001900	.000033	....	....	
14,250	57,000	.001967	.000067	....	....	
14,500	58,000	.002017	.000050	....	....	Elastic limit.
14,750	59,000	.003383	.001366	....	....	
15,000	60,000	.005500	.002117	....	....	
15,500	62,000	.006667	.001167	....	....	
16,000	64,000	.007783	.001116	....	....	
16,500	66,000	.009000	.001217	....	....	
17,000	68,000	.010500	.001500	....	....	
17,500	70,000	.011667	.001167	....	....	
18,000	72,000	.013000	.001333	....	....	
18,500	74,000	.014417	.001417	....	....	
19,000	76,000	.015867	.001450	....	....	
19,500	78,000	.017500	.001633	....	....	
20,000	80,000	.019250	.001750	....	....	
20,500	82,000	.021000	.001750	....	....	
21,000	84,000	.023083	.002083	....	....	
21,500	86,000	.025000	.001917	....	....	
22,000	88,000	.027250	.002250	....	....	
22,500	90,000	.029333	.002083	....	....	
23,000	92,000	.031667	.002334	....	....	
23,500	94,000	.034583	.002916	....	....	
24,000	96,000	.037333	.002750	....	....	
24,500	98,000	.0417	.004367	....	....	
25,000	100,000	.0450	.0033	....	....	
25,500	102,000	.0500	.0050	....	....	
26,000	104,000	.0550	.0050	....	....	
26,500	106,000	.0633	.0083	....	....	
27,000	108,000	.0767	.0134	....	....	
27,360	109,440	.1050	.0283	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	109,440
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1350
Elongation per inch under strain at elastic limit	do	.002017
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.25 from neck
Character of broken surface		silky; slightly granular
Elongation of inch sections		″.13, ″.20*, ″.12, ″.08, ″.08, ″.06

No. 2981.

Marks, $\substack{12\ \text{M B}_1\ \text{B}_2 \\ \text{T}_4\ \text{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000333	.000183	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001933	.000033	....	....	
14,750	59,000	.001983	.000050	....	....	
15,000	60,000	.002017	.000034	....	....	
15,250	61,000	.002050	.000033	....	....	Elastic limit.
15,500	62,000	.002150	.000100	....	....	
15,750	63,000	.002667	.000517	....	....	
16,000	64,000	.003733	.001066	....	....	
16,500	66,000	.005500	.001767	....	....	
17,000	68,000	.007000	.001500	....	....	
17,500	70,000	.008267	.001267	....	....	
18,000	72,000	.009833	.001566	....	....	
18,500	74,000	.011333	.001500	....	....	
19,000	76,000	.012583	.001250	....	....	
19,500	78,000	.014000	.001417	....	....	
20,000	80,000	.015667	.001667	....	....	
20,500	82,000	.017250	.001583	....	....	
21,000	84,000	.019050	.001800	....	....	
21,500	86,000	.020633	.001583	....	....	
22,000	88,000	.022533	.001900	....	....	
22,500	90,000	.024583	.002050	....	....	
23,000	92,000	.026667	.002084	....	....	
23,500	94,000	.029167	.002500	....	....	
24,000	96,000	.031667	.002500	....	....	
24,500	98,000	.034917	.003250	....	....	
25,000	100,000	.037417	.002500	....	....	
25,500	102,000	.0383	.000883	....	....	
26,000	104,000	.0450	.0067	....	....	
26,500	106,000	.0500	.0050	....	....	
27,000	108,000	.0583	.0083	....	....	
27,500	110,000	.0667	.0084	....	....	
28,000	112,000	.0850	.0183	....	....	
28,120	112,480	.1017	.0167	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	112,480
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.002050
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″.10 from neck
Character of broken surface		silky; trace of granulation
Elongation of inch sections		″.25*, ″.19, ″.12, ″.11, ″.08, ″.07

HOOP B_4.

Exterior diameter, 43″.375.
Interior diameter, 35″.375.

No. 2909.

Marks, $^{12}\frac{M\ B_1}{T_1\ M}B_4$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	.000017	.000017	
10,000	40,000	.001317	.000167	.000017	0.	
11,250	45,000	.001483	.000166	....	....	
11,500	46,000	.001533	.000050	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001617	.000050	....	....	
12,250	49,000	.001650	.000033	....	....	
12,500	50,000	.001700	.000050	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001783	.000050	....	....	Elastic limit.
13,250	53,000	.001867	.000084	....	....	
13,500	54,000	.002367	.000500	....	....	
13,750	55,000	.002733	.000366	....	....	
14,000	56,000	.003233	.000500	....	....	
14,250	57,000	.003633	.000400	....	....	
14,500	58,000	.004350	.000717	....	....	
15,000	60,000	.006000	.001650	....	....	
15,500	62,000	.007333	.001333	....	....	
16,000	64,000	.008533	.001200	....	....	
16,500	66,000	.010167	.001634	....	....	
17,000	68,000	.011683	.001516	....	....	
17,500	70,000	.013000	.001317	....	....	
18,000	72,000	.014583	.001583	....	....	
18,500	74,000	.016333	.001750	....	....	
19,000	76,000	.018167	.001834	....	....	
19,500	78,000	.019833	.001666	....	....	
20,000	80,000	.021667	.001834	....	....	
20,500	82,000	.023917	.002250	....	....	
21,000	84,000	.026000	.002083	....	....	
21,500	86,000	.028333	.002333	....	....	
22,000	88,000	.0317	.003367	....	....	
22,500	90,000	.0350	.0033	....	....	
23,000	92,000	.0367	.0017	....	....	
23,500	94,000	.0417	.0050	....	....	
24,000	96,000	.0500	.0083	....	....	
24,500	98,000	.0550	.0050	....	....	
25,000	100,000	.0617	.0067	....	....	
25,500	102,000	.0700	.0083	....	....	
26,000	104,000	.0950	.0250	....	....	
26,030	104,120	.1033	.0083	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	104,120
Elastic limit per square inch of original section	do	52,000
Elongation per inch after rupture	inch	0.146
Elongation per inch under strain at elastic limit	do	.001783
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2″.10 from neck
Character of broken surface		granular, 50 per cent.; silky, 50 per cent.
Elongation of inch sections		″.09, ″.11, ″.13, ″.16, ″.28*, ″.11

No. 2910.

Marks, $^{12\,M\,R_1\,B_4}_{T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000317	.000150	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000650	.000167	0.	....	
6, 250	25, 000	.000800	.000150	0.	....	
7, 500	30, 000	.000983	.000183	0.	....	
8, 750	35, 000	.001150	.000167	0.	....	
10, 000	40, 000	.001300	.000150	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
11, 500	46, 000	.001500	.000033	....	....	
11, 750	47, 000	.001533	.000033	....	....	
12, 000	48, 000	.001583	.000050	....	....	
12, 250	49, 000	.001617	.000034	....	....	
12, 500	50, 000	.001650	.000033	....	....	
12, 750	51, 000	.001683	.000033	....	....	
13, 000	52, 000	.001717	.000034	....	....	
13, 250	53, 000	.001750	.000033	....	....	
13, 500	54, 000	.001783	.000033	....	....	
13, 750	55, 000	.001800	.000017	....	....	
14, 000	56, 000	.001850	.000050	....	....	
14, 250	57, 000	.001883	.000033	....	....	
14, 500	58, 000	.001933	.000050	....	....	
14, 750	59, 000	.001967	.000034	....	....	
15, 000	60, 000	.002000	.000033	....	....	
15, 250	61, 000	.002050	.000050	....	....	Elastic limit.
15, 500	62, 000	.002117	.000067	....	....	
15, 750	63, 000	.002233	.000116	....	....	
16, 000	64, 000	.002483	.000250	....	....	
16, 250	65, 000	.002767	.000284	....	....	
16, 500	66, 000	.003233	.000466	....	....	
17, 000	68, 000	.004500	.001267	....	....	
17, 500	70, 000	.006167	.001667	....	....	
18, 000	72, 000	.007750	.001583	....	....	
18, 500	74, 000	.008000	.000250	....	....	
19, 000	76, 000	.011000	.003000	....	....	
19, 500	78, 000	.012117	.001117	....	....	
20, 000	80, 000	.013617	.001500	....	....	
20, 500	82, 000	.015283	.001666	....	....	
21, 000	84, 000	.017000	.001717	....	....	
21, 500	86, 000	.018750	.001750	....	....	
22, 000	88, 000	.020500	.001750	....	....	
22, 500	90, 000	.022333	.001833	....	....	
23, 000	92, 000	.024500	.002167	....	....	
23, 500	94, 000	.026583	.002083	....	....	
24, 000	96, 000	.029167	.002584	....	....	
24, 500	98, 000	.032000	.002833	....	....	
25, 000	100, 000	.034750	.002750	....	....	
25, 500	102, 000	.0383	.003550	....	....	
26, 000	104, 000	.0417	.0034	....	....	
26, 500	106, 000	.0467	.0050	....	....	
27, 000	108, 000	.0533	.0066	....	....	
27, 500	110, 000	.0617	.0084	....	....	
28, 000	112, 000	.0783	.0166	....	....	
28, 190	112, 760	.1000	.0217	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	112, 760
Elastic limit per square inch of original section	do....	61, 000
Elongation per inch after rupture	inch..	0. 1367
Elongation per inch under strain at elastic limit	do....	.002050
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		2″.15 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		″.11, ″.25, ″.17, ″.11, ″.10, ″.08

No. 2911.

Marks, $^{12\ \text{M}\ \text{R},\ \text{B}_4}_{\quad\text{T},\ \text{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	.000017	.000017	
11,250	45,000	.001517	.000167	....	....	
11,500	46,000	.001550	.000033	....	....	
11,750	47,000	.001583	.000033	....	....	
12,000	48,000	.001633	.000050	....	....	
12,250	49,000	.001667	.000034	....	....	Elastic limit.
12,500	50,000	.001750	.000083	....	....	
12,750	51,000	.001800	.000050	....	....	
13,000	52,000	.002000	.000200	....	....	
13,250	53,000	.002233	.000233	....	....	
13,500	54,000	.002633	.000400	....	....	
13,750	55,000	.002933	.000300	....	....	
14,000	56,000	.003550	.000617	....	....	
14,250	57,000	.004100	.000550	....	....	
14,500	58,000	.004633	.000533	....	....	
14,750	59,000	.005150	.000517	....	....	
15,000	60,000	.005967	.000817	....	....	
15,500	62,000	.007417	.001450	....	....	
16,000	64,000	.008833	.001416	....	....	
16,500	66,000	.010500	.001667	....	....	
17,000	68,000	.011950	.001450	....	....	
17,500	70,000	.013583	.001633	....	....	
18,000	72,000	.015250	.001667	....	....	
18,500	74,000	.017083	.001833	....	....	
19,000	76,000	.018933	.001850	....	....	
19,500	78,000	.020667	.001734	....	....	
20,000	80,000	.022500	.001833	....	....	
20,500	82,000	.024750	.002250	....	....	
21,000	84,000	.027000	.002250	....	....	
21,500	86,000	.029667	.002667	....	....	
22,000	88,000	.032500	.002833	....	....	
22,500	90,000	.035583	.003083	....	....	
23,000	92,000	.0383	.002717	....	....	
23,500	94,000	.0433	.0050	....	....	
24,000	96,000	.0483	.0050	....	....	
24,500	98,000	.0533	.0050	....	....	
25,000	100,000	.0633	.0100	....	....	
25,500	102,000	.0783	.0150	....	....	
25,820	103,280	.1100	.0317	....	....	Tensile strength.

General summary.

Specific gravity		7.8530
Hardness		21.89
Tensile strength per square inch of original section	pounds	103,280
Elastic limit per square inch of original section	do.	49,000
Elongation per inch after rupture	inch	0.1483
Elongation per inch under strain at elastic limit	do.	.001667
Reduction in diameter at point of rupture	do.	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		3″.15 from neck
Character of broken surface		silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections		″.08, ″.12, ″.16, ″.21*, ″.12, ″.09

No. 2912.

Marks, $\substack{12\ M\ R,\ B_4 \\ T_4\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads,		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000300	.000133	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166	0.		
10,000	40,000	.001300	.000167	0.		
11,250	45,000	.001467	.000167			
11,500	46,000	.001500	.000033			
11,750	47,000	.001533	.000033			
12,000	48,000	.001567	.000034			
12,250	49,000	.001600	.000033			
12,500	50,000	.001650	.000050			
12,750	51,000	.001683	.000033			
13,000	52,000	.001717	.000034			
13,250	53,000	.001750	.000033			
13,500	54,000	.001800	.000050			
13,750	55,000	.001833	.000033			Elastic limit.
14,000	56,000	.001967	.000134			
14,250	57,000	.002200	.000233			
14,500	58,000	.002700	.000500			
14,750	59,000	.003100	.000400			
15,000	60,000	.003862	.000767			
15,500	62,000	.005500	.001633			
16,000	64,000	.007167	.001667			
16,500	66,000	.008750	.001583			
17,000	68,000	.010333	.001583			
17,500	70,000	.011950	.001617			
18,000	72,000	.013683	.001733			
18,500	74,000	.015350	.001667			
19,000	76,000	.017250	.001900			
19,500	78,000	.019050	.001800			
20,000	80,000	.020883	.001833			
20,500	82,000	.023000	.002117			
21,000	84,000	.025417	.002417			
21,500	86,000	.027767	.002350			
22,000	88,000	.030583	.002816			
22,500	90,000	.033500	.002917			
23,000	92,000	.0367	.0032			
23,500	94,000	.0400	.0033			
24,000	96,000	.0467	.0067			
24,500	98,000	.0533	.0066			
25,000	100,000	.0583	.0050			
25,500	102,000	.0700	.0117			
25,980	103,920	.1033	.0333			Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 103,920
Elastic limit per square inch of original section..........do.... 55,000
Elongation per inch after rupture..........inch.. 0.1467
Elongation per inch under strain at elastic limit..........do.... .001833
Reduction in diameter at point of rupture..........do.... .1341
Reduction in area after rupture, per centum of original section.......... 41.9
Position of rupture..........3¼″ from neck
Character of broken surface..........granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections..........″.08, ″.12, ″.19, ″.29*, ″.11, ″09

No. 3000.

Marks, $^{12}\frac{M\ E_1\ B_4}{T_8\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000667	.000184	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001017	.000184	.000017	.000017	
8,750	35,000	.001183	.000166	.000017	0.	
10,000	40,000	.001350	.000167	.000017	....	
11,250	45,000	.001517	.000167	....	....	
12,500	50,000	.001683	.000166	....	....	
12,750	51,000	.001733	.000050	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001833	.000033	....	....	
13,750	55,000	.001883	.000050	....	....	
14,000	56,000	.001950	.000067	....	....	Elastic limit.
14,250	57,000	.002033	.000083	....	....	
14,500	58,000	.002283	.000250	....	....	
14,750	59,000	.002500	.000217	....	....	
15,000	60,000	.002833	.000333	....	....	
15,500	62,000	.003667	.000834	....	....	
16,000	64,000	.004733	.001066	....	....	
16,500	66,000	.005917	.001184	....	....	
17,000	68,000	.007283	.001366	....	....	
17,500	70,000	.008667	.001384	....	....	
18,000	72,000	.010083	.001416	....	....	
18,500	74,000	.011517	.001434	....	....	
19,000	76,000	.012917	.001400	....	....	
19,500	78,000	.014500	.001583	....	....	
20,000	80,000	.016167	.001667	....	....	
20,500	82,000	.017833	.001666	....	....	
21,000	84,000	.019583	.001750	....	....	
21,500	86,000	.021433	.001850	....	....	
22,000	88,000	.023417	.001984	....	....	
22,500	90,000	.025500	.002083	....	....	
23,000	92,000	.027833	.002333	....	....	
23,500	94,000	.030667	.002834	....	....	
24,000	96,000	.033083	.002416	....	....	
24,500	98,000	.0367	.003617	....	....	
25,000	100,000	.0392	.0025	....	....	
25,500	102,000	.0450	.0058	....	....	
26,000	104,000	.0500	.0050	....	....	
26,500	106,000	.0550	.0050	....	....	
27,000	108,000	.0650	.0100	....	....	
27,500	110,000	.0817	.0167	....	....	
27,680	110,720	.1033	.0216	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....pounds.. 110,720
Elastic limit per square inch of original section....do.... 56,000
Elongation per inch after rupture....inch.. 0.1333
Elongation per inch under strain at elastic limit....do.... .001950
Reduction in diameter at point of rupture....do.... .104
Reduction in area after rupture, per centum of original section.... 23.5
Position of rupture....3" from neck
Character of broken surface....granular; silky center
Elongation of inch sections....".08, ".12, ".27* ".14, ".11, ".08

No. 2929.

Marks, $^{12}\frac{\mathrm{M\,B_1}}{\mathrm{T_6\,O}}{}^{\mathrm{B_4}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	**Initial load.**
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000 66	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	.000017	.000017	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001733	.000050	....	....	
13,250	53,000	.001750	.000017	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001817	.000017	....	....	
14,000	56,000	.001850	.000033	....	....	
14,250	57,000	.001900	.000050	....	....	
14,500	58,000	.001933	.000033	....	....	
14,750	59,000	.001967	.000034	....	....	
15,000	60,000	.002017	.000050	....	....	
15,250	61,000	.002067	.000050	....	....	
15,500	62,000	.002100	.000033	....	....	
15,750	63,000	.002133	.000033	....	....	**Elastic limit.**
16,000	64,000	.002233	.000100	....	....	
16,250	65,000	.002317	.000084	....	....	
16,500	66,000	.002617	.000300	....	....	
16,750	67,000	.002900	.000283	....	....	
17,000	68,000	.003350	.000450	....	....	
17,500	70,000	.004833	.001483	....	....	
18,000	72,000	.006333	.001500	....	....	
18,500	74,000	.007583	.001250	....	....	
19,000	76,000	.009333	.001750	....	....	
19,500	78,000	.010800	.001467	....	....	
20,000	80,000	.012333	.001533	....	....	
20,500	82,000	.013667	.001334	....	....	
21,000	84,000	.015000	.001333	....	....	
21,500	86,000	.016500	.001500	....	....	
22,000	88,000	.018333	.001833	....	....	
22,500	90,000	.020000	.001667	....	....	
23,000	92,000	.021833	.001833	....	....	
23,500	94,000	.023667	.001834	....	....	
24,000	96,000	.025583	.001916	....	....	
24,500	98,000	.027667	.002084	....	....	
25,000	100,000	.030667	.003000	....	....	
25,500	102,000	.032750	.002083	....	....	
26,000	104,000	.0367	.003950	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0450	.0050	....	....	
27,500	110,000	.0500	.0050	....	....	
28,000	112,000	.0567	.0067	....	....	
28,500	114,000	.0667	.0100	....	....	
29,000	116,000	.0867	.0200	....	....	
29,080	116,320	.0967	.0100	....	....	**Tensile strength.**

General summary.

Tensile strength per square inch of original section	**pounds**	**116,320**
Elastic limit per square inch of original section	**do**	**63,000**
Elongation per inch after rupture	**inch**	**0.1183**
Elongation per inch under strain at elastic limit	**do**	**.002133**
Reduction in diameter at point of rupture	**do**	**.104**
Reduction in area after rupture, per centum of original section		**33.5**
Position of rupture		**3″ from neck**
Character of broken surface		**granular; silky center**
Elongation of inch sections		**″.07, ″.09, ″.12, ″.26*, ″.10, ″.07**

No. 2930.

Marks, $^{12}\frac{M\,R_1}{T_7\,M}B_4$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167	0.		
10,000	40,000	.001333	.000166	0.		
11,250	45,000	.001500	.000167			
12,500	50,000	.001667	.000167			
12,750	51,000	.001700	.000033			
13,000	52,000	.001750	.000050			
13,250	53,000	.001783	.000033			
13,500	54,000	.001817	.000034			
13,750	55,000	.001850	.000033			
14,000	56,000	.001900	.000050			
14,250	57,000	.001967	.000067			Elastic limit.
14,500	58,000	.002133	.000166			
14,750	59,000	.002617	.000484			
15,000	60,000	.003117	.000500			
15,500	62,000	.004167	.001050			
16,000	64,000	.005500	.001333			
16,500	66,000	.006867	.001367			
17,000	68,000	.008267	.001400			
17,500	70,000	.009917	.001650			
18,000	72,000	.011200	.001283			
18,500	74,000	.012500	.001300			
19,000	76,000	.014000	.001500			
19,500	78,000	.015500	.001500			
20,000	80,000	.017333	.001833			
20,500	82,000	.019000	.001667			
21,000	84,000	.020750	.001750			
21,500	86,000	.022667	.001917			
22,000	88,000	.024750	.002083			
22,500	90,000	.027000	.002250			
23,000	92,000	.029667	.002667			
23,500	94,000	.032000	.002333			
24,000	96,000	.034917	.002917			
24,500	98,000	.0383	.003383			
25,000	100,000	.0450	.0067			
25,500	102,000	.0483	.0033			
26,000	104,000	.0533	.0050			
26,500	106,000	.0633	.0100			
27,000	108,000	.0750	.0117			
27,360	109,440	.1033	.0283			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	109,440
Elastic limit per square inch of original section	do	57,000
Elongation per inch after rupture	inch	0.1350
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		2".30 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		".10, ".26*, ".20*, ".11, ".08, ".07

No. 2931.

Marks, $^{12}\frac{M\,R_1\,B_4}{T_3\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	....	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001833	.000033	....	....	
14,250	57,000	.001883	.000050	....	....	Elastic limit.
14,500	58,000	.002000	.000117	....	....	
14,750	59,000	.002167	.000167	....	....	
15,000	60,000	.002350	.000183	....	....	
15,500	62,000	.003250	.000900	....	....	
16,000	64,000	.004267	.001017	....	....	
16,500	66,000	.005417	.001150	....	....	
17,000	68,000	.007000	.001583	....	....	
17,500	70,000	.008667	.001667	....	....	
18,000	72,000	.010083	.001416	....	....	
18,500	74,000	.011667	.001584	....	....	
19,000	76,000	.013167	.001500	....	....	
19,500	78,000	.014917	.001750	....	....	
20,000	80,000	.016667	.001750	....	....	
20,500	82,000	.018550	.001883	....	....	
21,000	84,000	.020333	.001783	....	....	
21,500	86,000	.022417	.002084	....	....	
22,000	88,000	.024500	.002083	....	....	
22,500	90,000	.027167	.002667	....	....	
23,000	92,000	.029667	.002500	....	....	
23,500	94,000	.032417	.002750	....	....	
24,000	96,000	.035333	.002916	....	....	
24,500	98,000	.0383	.002967	....	....	
25,000	100,000	.0450	.0067	....	....	
25,500	102,000	.0500	.0050	....	....	
26,000	104,000	.0550	.0050	....	....	
26,500	106,000	.0650	.0100	....	....	
27,000	108,000	.0817	.0167	....	....	
27,110	108,440	.0967	.0150	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	108,440
Elastic limit per square inch of original section	do	57,000
Elongation per inch after rupture	inch	0.1150
Elongation per inch under strain at elastic limit	do	.001883
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.45 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.07, ″.07, ″.08, ″.09, ″.26*, ″.12

HOOP B₅.

Exterior diameter, 43".25.
Interior diameter, 35".25.

No. 2905.

Marks, $12\,\frac{M\ B_1}{T_1\ M}\,B_5$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000650	.000150	0.		
6,250	25,000	.000817	.000167	0.		
7,500	30,000	.001000	.000183	0.		
8,750	35,000	.001183	.000183	0.		
10,000	40,000	.001367	.000184	0.		
11,250	45,000	.001517	.000150			
11,500	46,000	.001550	.000033			
11,750	47,000	.001583	.000033			
12,000	48,000	.001633	.000050			
12,250	49,000	.001667	.000034			
12,500	50,000	.001717	.000050			Elastic limit.
12,750	51,000	.001833	.000116			
13,000	52,000	.002050	.000217			
13,250	53,000	.002400	.000350			
13,500	54,000	.003000	.000600			
13,750	55,000	.003433	.000433			
14,000	56,000	.004000	.000567			
14,250	57,000	.004517	.000517			
14,500	58,000	.005333	.000816			
14,750	59,000	.005833	.000500			
15,000	60,000	.006517	.000684			
15,500	62,000	.008167	.001650			
16,000	64,000	.009667	.001500			
16,500	66,000	.011250	.001583			
17,000	68,000	.012667	.001417			
17,500	70,000	.014417	.001750			
18,000	72,000	.016000	.001583			
18,500	74,000	.017700	.001700			
19,000	76,000	.019450	.001750			
19,500	78,000	.021367	.001917			
20,000	80,000	.023533	.002166			
20,500	82,000	.025667	.002134			
21,000	84,000	.028083	.002416			
21,500	86,000	.030667	.002584			
22,000	88,000	.033750	.003083			
22,500	90,000	.0367	.002950			
23,000	92,000	.0433	.0066			
23,500	94,000	.0467	.0034			
24,000	96,000	.0517	.0050			
24,500	98,000	.0600	.0083			
25,000	100,000	.0683	.0083			
25,500	102,000	.0867	.0184			
25,690	102,760	.1133	.0266			Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 102,760
Elastic limit per square inch of original section..................................do .. 50,000
Elongation per inch after rupture..................................inch.. 0.1433
Elongation per inch under strain at elastic limit..................................do.... .001717
Reduction in diameter at point of rupture..................................do.... .124
Reduction in area after rupture, per centum of original section.................................. 39.3
Position of rupture..................................2".45 from neck
Character of broken surface..................................silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections..................................".08, ".09, ".12, ".28*, ".19, ".10

No. 2906.

Marks, $^{12}\,\frac{\text{M R, Bs}}{\text{T, O}}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001350	.000183	0.	....	
11,250	45,000	.001517	.000167	....	....	
11,500	46,000	.001550	.000033	....	....	
11,750	47,000	.001583	.000033	....	....	
12,000	48,000	.001633	.000050	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001700	.000033	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001817	.000050	....	....	
13,500	54,000	.001867	.000050	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001933	.000033	....	....	
14,250	57,000	.001983	.000050	....	....	
14,500	58,000	.002033	.000050	....	....	
14,750	59,000	.002083	.000050	....	....	Elastic limit.
15,000	60,000	.003000	.000917	....	....	
15,250	61,000	.004167	.001167	....	....	
15,500	62,000	.005017	.000850	....	....	
16,000	64,000	.006500	.001483	....	....	
16,500	66,000	.008083	.001583	....	....	
17,000	68,000	.009333	.001250	....	....	
17,500	70,000	.010667	.001334	....	....	
18,000	72,000	.012017	.001350	....	....	
18,500	74,000	.013667	.001650	....	....	
19,000	76,000	.015033	.001366	....	....	
19,500	78,000	.016633	.001600	....	....	
20,000	80,000	.018417	.001784	....	....	
20,500	82,000	.020000	.001583	....	....	
21,000	84,000	.022000	.002000	....	....	
21,500	86,000	.023917	.001917	....	....	
22,000	88,000	.026000	.002083	....	....	
22,500	90,000	.028500	.002500	....	....	
23,000	92,000	.031167	.002667	....	....	
23,500	94,000	.033833	.002666	....	....	
24,000	96,000	.0367	.002867	....	....	
24,500	98,000	.0417	.0050	....	....	
25,000	100,000	.0467	.0050	....	....	
25,500	102,000	.0517	.0050	....	....	
26,000	104,000	.0600	.0083	....	....	
26,500	106,000	.0700	.0100	....	....	
27,000	108,000	.0867	.0167	....	....	
27,130	108,520	.1133	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	108,520
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1550
Elongation per inch under strain at elastic limit	do....	.002083
Reduction in diameter at point of rupture	do....	.143
Reduction in area after rupture, per centum of original section		41.6
Position of rupture		2".90 from neck
Character of broken surface		silky, slightly granular
Elongation of inch sections		".09, ".11, ".13, ".36*, ".13, ".11

No. 2907

Marks, $^{12}\frac{M\ R_1\ B_5}{T_1\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial point.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000183	.000016	0.	....	
3,750	15,000	.000517	.000334	0.	....	
5,000	20,000	.000683	.000166	0.	....	
6,250	25,000	.000867	.000184	.000017	.000017	
7,500	30,000	.001050	.000183	.000033	.000016	
8,750	35,000	.001217	.000167	.000033	0.	
10,000	40,000	.001400	.000183	.000050	.000017	
11,250	45,000	.001583	.000183	....	....	
11,500	46,000	.001617	.000034	....	....	
11,750	47,000	.001650	.000033	....	....	
12,000	48,000	.001683	.000033	....	....	
12,250	49,000	.001717	.000034	....	....	
12,500	50,000	.001750	.000033	....	....	
12,750	51,000	.001783	.000033	....	....	
13,000	52,000	.001833	.000050	....	....	
13,250	53,000	.001867	.000034	....	....	Elastic limit.
13,500	54,000	.001967	.000100	....	....	
13,750	55,000	.002100	.000133	....	....	
14,000	56,000	.003683	.001583	....	....	
14,250	57,000	.004667	.000984	....	....	
14,500	58,000	.005333	.000666	....	....	
14,750	59,000	.005917	.000584	....	....	
15,000	60,000	.006667	.000750	....	....	
15,500	62,000	.008117	.001450	....	....	
16,000	64,000	.009550	.001433	....	....	
16,500	66,000	.011083	.001533	....	....	
17,000	68,000	.012583	.001500	....	....	
17,500	70,000	.014167	.001584	....	....	
18,000	72,000	.015917	.001750	....	....	
18,500	74,000	.017667	.001750	....	....	
19,000	76,000	.019667	.002000	....	....	
19,500	78,000	.021667	.002000	....	....	
20,000	80,000	.023667	.002000	....	....	
20,500	82,000	.026000	.002333	....	....	
21,000	84,000	.028333	.002333	....	....	
21,500	86,000	.031000	.002667	....	....	
22,000	88,000	.034000	.003000	....	....	
22,500	90,000	.0367	.0027	....	....	
23,000	92,000	.0417	.0050	....	....	
23,500	94,000	.0467	.0050	....	....	
24,000	96,000	.0517	.0050	....	....	
24,500	98,000	.0600	.0083	....	....	
25,000	100,000	.0700	.0100	....	....	
25,500	102,000	.0950	.0250	....	....	
25,540	102,160	.1067	.0117	....	....	Tensile strength.

General summary.

Specific gravity		7.8543
Hardness		21.52
Tensile strength per square inch of original section	pounds	102,160
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.1467
Elongation per inch under strain at elastic limit	do	.001867
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		2".85 from neck
Character of broken surface		silky
Elongation of inch sections		".09, ".13, ".36*, ".12, ".09, ".09

No. 2908.

Marks, $^{12}\genfrac{}{}{0pt}{}{\text{M R, B}_5}{\text{T}_4\text{ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001117	.000167	0.	....	
10,000	40,000	.001283	.000166	0.	....	
11,250	45,000	.001467	.000184	....	....	
11,500	46,000	.001500	.000033	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001633	.000033	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001717	.000050	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001817	.000034	....	....	Elastic limit.
14,000	56,000	.001933	.000116	....	....	
14,250	57,000	.002133	.000200	....	....	
14,500	58,000	.002750	.000617	....	....	
14,750	59,000	.003417	.000667	....	....	
15,000	60,000	.004333	.000916	....	....	
15,500	62,000	.006033	.001700	....	....	
16,000	64,000	.007667	.001634	....	....	
16,500	66,000	.009750	.002083	....	....	
17,000	68,000	.011333	.001583	....	....	
17,500	70,000	.012917	.001584	....	....	
18,000	72,000	.014583	.001666	....	....	
18,500	74,000	.016417	.001834	....	....	
19,000	76,000	.018333	.001916	....	....	
19,500	78,000	.020750	.002417	....	....	
20,000	80,000	.022500	.001750	....	....	
20,500	82,000	.024833	.002333	....	....	
21,000	84,000	.027500	.002667	....	....	
21,500	86,000	.030333	.002833	....	....	
22,000	88,000	.033333	.003000	....	....	
22,500	90,000	.0367	.003367	....	....	
23,000	92,000	.0417	.0050	....	....	
23,500	94,000	.0467	.0050	....	....	
24,000	96,000	.0517	.0050	....	....	
24,500	98,000	.0633	.0016	....	....	
25,000	100,000	.0733	.0100	....	....	
25,500	102,000	.1000	.0267	....	....	
25,520	102,080	.1133	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	102,080
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1633
Elongation per inch under strain at elastic limit	do....	.001817
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		2″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.09, ″.12, ″.13, ″.36*, ″.16, ″.12

No. 3006.

Marks, $^{12}\frac{\text{M R}_1\text{ B}_1}{\text{T}_1\text{ M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000950	.000167	0.	....	
8,750	35,000	.001117	.000167	0.	....	
10,000	40,000	.001283	.000166	0.	....	
11,250	45,000	.001450	.000167	....	....	
12,500	50,000	.001617	.000167	....	....	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001700	.000050	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001817	.000050	....	....	
14,000	56,000	.001867	.000050	....	....	Elastic limit.
14,250	57,000	.001983	.000116	....	....	
14,500	58,000	.002833	.000850	....	....	
14,750	59,000	.003333	.000500	....	....	
15,000	60,000	.005017	.000584	....	....	
15,500	62,000	.005167	.001250	....	....	
16,000	64,000	.006567	.001400	....	....	
16,500	66,000	.008000	.001433	....	....	
17,000	68,000	.009417	.001417	....	....	
17,500	70,000	.010750	.001333	....	....	
18,000	72,000	.012167	.001417	....	....	
18,500	74,000	.013667	.001500	....	....	
19,000	76,000	.015267	.001600	....	....	
19,500	78,000	.016917	.001650	....	....	
20,000	80,000	.018667	.001750	....	....	
20,500	82,000	.020417	.001750	....	....	
21,000	84,000	.022333	.001916	....	....	
21,500	86,000	.024167	.001834	....	....	
22,000	88,000	.026667	.002500	....	....	
22,500	90,000	.028917	.002250	....	....	
23,000	92,000	.031833	.002916	....	....	
23,500	94,000	.034500	.002667	....	....	
24,000	96,000	.0367	.0022	....	....	
24,500	98,000	.0417	.0050	....	....	
25,000	100,000	.0483	.0066	....	....	
25,500	102,000	.0533	.0050	....	....	
26,000	104,000	.0617	.0084	....	....	
26,500	106,000	.0717	.0100	....	....	
26,900	107,600	.1033	.0316	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 107,600
Elastic limit per square inch of original section..........do.... 56,000
Elongation per inch after rupture..........inch.. 0.1400
Elongation per inch under strain at elastic limit..........do.... .001867
Reduction in diameter at point of rupture..........do.... .124
Reduction in area after rupture, per centum of original section.......... 39.2
Position of rupture..........2″.85 from neck
Character of broken surface..........silky, 60 per cent.; granular, 40 per cent.
Elongation of inch sections..........″.09, ″.14, ″.31*, ″.12, ″.10, ″.07

No. 3007.

Marks, $^{12\,\mathrm{M\,R_1\,B_1}}_{\quad\mathrm{T\;O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001467	.000167	....	....	
12,500	50,000	.001633	.000166	....	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001833	.000033	....	....	
14,250	57,000	.001867	.000034	....	....	
14,500	58,000	.001917	.000050	....	....	
14,750	59,000	.001967	.000050	....	....	
15,000	60,000	.002000	.000033	....	....	
15,250	61,000	.002033	.000033	....	....	Elastic limit.
15,500	62,000	.002133	.000100	....	....	
15,750	63,000	.002217	.000084	....	....	
16,000	64,000	.002550	.000333	....	....	
16,250	65,000	.002883	.000333	....	....	
16,500	66,000	.003500	.000617	....	....	
17,000	68,000	.004750	.001250	....	....	
17,500	70,000	.006333	.001583	....	....	
18,000	72,000	.007667	.001334	....	....	
18,500	74,000	.009100	.001433	....	....	
19,000	76,000	.010517	.001417	....	....	
19,500	78,000	.012000	.001483	....	....	
20,000	80,000	.013467	.001467	....	....	
20,500	82,000	.015017	.001550	....	....	
21,000	84,000	.016600	.001583	....	....	
21,500	86,000	.018333	.001733	....	....	
22,000	88,000	.020000	.001667	....	....	
22,500	90,000	.022000	.002000	....	....	
23,000	92,000	.024000	.002000	....	....	
23,500	94,000	.026000	.002000	....	....	
24,000	96,000	.028333	.002333	....	....	
24,500	98,000	.030833	.002500	....	....	
25,000	100,000	.033750	.002917	....	....	
25,500	102,000	.0367	.002950	....	....	
26,000	104,000	.0400	.0033	....	....	
26,500	106,000	.0467	.0067	....	....	
27,000	108,000	.0533	.0066	....	....	
27,500	110,000	.0600	.0067	....	....	
28,000	112,000	.0683	.0083	....	....	
28,500	114,000	.0967	.0284	....	....	
28,530	114,120	.1033	.0066	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 114,120
Elastic limit per square inch of original section...do.... 61,000
Elongation per inch after rupture ....inch.. 0.1450
Elongation per inch under strain at elastic limit ....do .... .002033
Reduction in diameter at point of rupture ....do.... .114
Reduction in area after rupture, per centum of original section................................ 36.4
Position of rupture.... ....2″.60 from neck
Character of broken surface ....granular; silky center
Elongation of inch sections ....″.10, ″.15, ″.29*, ″.13, ″,11, ″.09

No. 3008.

Marks, $^{12}\,\frac{M\;B_1\;B_5}{T,\;M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000483	.000183	0.		
5,000	20,000	.000650	.000167	0.		
6,250	25,000	.000817	.000167	0.		
7,500	30,000	.001000	.000183	0.		
8,750	35,000	.001167	.000167	0.		
10,000	40,000	.001350	.000183	0.		
11,250	45,000	.001517	.000167			
12,500	50,000	.001683	.000166			
12,750	51,000	.001717	.000034			
13,000	52,000	.001767	.000050			
13,250	53,000	.001817	.000050			
13,500	54,000	.001833	.000016			
13,750	55,000	.001867	.000034			
14,000	56,000	.001917	.000050			
14,250	57,000	.001950	.000033			Elastic limit.
14,500	58,000	.002017	.000067			
14,750	59,000	.002517	.000500			
15,000	60,000	.003200	.000683			
15,500	62,000	.004500	.001300			
16,000	64,000	.005917	.001417			
16,500	66,000	.007333	.001416			
17,000	68,000	.008783	.001450			
17,500	70,000	.010167	.001384			
18,000	72,000	.011750	.001583			
18,500	74,000	.013333	.001583			
19,000	76,000	.014833	.001500			
19,500	78,000	.016500	.001667			
20,000	80,000	.018083	.001583			
20,500	82,000	.019833	.001750			
21,000	84,000	.022000	.002167			
21,500	86,000	.024167	.002167			
22,000	88,000	.026250	.002083			
22,500	90,000	.028667	.002417			
23,000	92,000	.031000	.002333			
23,500	94,000	.034000	.003000			
24,000	96,000	.037250	.003250			
24,500	98,000	.040833	.003583			
25,000	100,000	.0467	.005867			
25,500	102,000	.0533	.0066			
26,000	104,000	.0600	.0067			
26,500	106,000	.0700	.0100			
26,980	107,920	.1017	.0317			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	107,920
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1467
Elongation per inch under strain at elastic limit	do	.001950
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2″.20 from neck
Character of broken surface		silky; somewhat granular at circumference
Elongation of inch sections		″.08, ″.10, ″.13, ″.20, ″.28*, ″.09

No. 3009.

Marks, $^{12}\overset{M\ R,\ B_6}{T_8\ I}$
Diameter, ''564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	....	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001733	.000033	....	....	
13, 500	54, 000	.001783	.000050	....	....	
13, 750	55, 000	.001833	.000050	....	....	Elastic limit.
14, 000	56, 000	.002467	.000634	....	....	
14, 250	57, 000	.003000	.000533	....	....	
14, 500	58, 000	.003700	.000700	....	....	
14, 750	59, 000	.004333	.000633	....	....	
15, 000	60, 000	.005167	.000834	....	....	
15, 500	62, 000	.006783	.001616	....	....	
16, 000	64, 000	.008267	.001484	....	....	
16, 500	66, 000	.010000	.001733	....	....	
17, 000	68, 000	.011500	.001500	....	....	
17, 500	70, 000	.013333	.001833	....	....	
18, 000	72, 000	.014833	.001500	....	....	
18, 500	74, 000	.016667	.001834	....	....	
19, 000	76, 000	.018500	.001833	....	....	
19, 500	78, 000	.020500	.002000	....	....	
20, 000	80, 000	.022667	.002167	....	....	
20, 500	82, 000	.025000	.002333	....	....	
21, 000	84, 000	.027333	.002333	....	....	
21, 500	86, 000	.030167	.002834	....	....	
22, 000	88, 000	.033333	.003166	....	....	
22, 500	90, 000	.036667	.003334	....	....	
23, 000	92, 000	.0400	.003333	....	....	
23, 500	94, 000	.0467	.0067	....	....	
24, 000	96, 000	.0517	.0050	....	....	
24, 500	98, 000	.0600	.0083	....	....	
25, 000	100, 000	.0717	.0117	....	....	
25, 500	102, 000	.0983	.0266	....	....	
25, 530	102, 120	.1183	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	102, 120
Elastic limit per square inch of original section	do	55, 000
Elongation per inch after rupture	inch	0. 1650
Elongation per inch under strain at elastic limit	do	.001833
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		2.70 from neck
Character of broken surface		silky
Elongation of inch sections		".10, ".12, ".15, ".34*, ".18, ".10

HOOP R4.

Exterior diameter, 42''.75.
Interior diameter, 35''.25.

No. 2870.

Marks, 12 M R, B6 T, M
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000183	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001783	.000050	....	....	
13,500	54,000	.001833	.000050	....	....	
13,750	55,000	.001867	.000034	....	....	
14,000	56,000	.001900	.000033	....	....	
14,250	57,000	.001950	.000050	....	....	
14,500	58,000	.002000	.000050	....	....	Elastic limit.
14,750	59,000	.002100	.000100	....	....	
15,000	60,000	.002333	.000233	....	....	
15,250	61,000	.002583	.000250	....	....	
15,500	62,000	.003050	.000167	....	....	
16,000	64,000	.004517	.001467	....	....	
16,500	66,000	.006250	.001733	....	....	
17,000	68,000	.007917	.001667	....	....	
17,500	70,000	.009583	.001666	....	....	
18,000	72,000	.011133	.001550	....	....	
18,500	74,000	.012667	.001534	....	....	
19,000	76,000	.014200	.001533	....	....	
19,500	78,000	.016167	.001967	....	....	
20,000	80,000	.017800	.001633	....	....	
20,500	82,000	.019667	.001867	....	....	
21,000	84,000	.021667	.002000	....	....	
21,500	86,000	.023833	.002166	....	....	
22,000	88,000	.026250	.002417	....	....	
22,500	90,000	.028667	.002417	....	....	
23,000	92,000	.031583	.002916	....	....	
23,500	94,000	.0333	.001717	....	....	
24,000	96,000	.0367	.0034	....	....	
24,500	98,000	.0417	.0050	....	....	
25,000	100,000	.0483	.0066	....	....	
25,500	102,000	.0550	.0067	....	....	
26,000	104,000	.0650	.0100	....	....	
26,500	106,000	.0817	.0167	....	....	
26,650	106,600	.1050	.0233	....	....	Tensile strength.

General summary.

Specific gravity		7.8561
Hardness		22.90
Tensile strength per square inch of original section	pounds	106,600
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1400
Elongation per inch under strain at elastic limit	do	.002000
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1''.50 from neck
Character of broken surface		silky, interspersed with granular metal at circumference
Elongation of inch sections		''.12, ''.30*, ''.13, ''.12, ''.06, ''.05

No. 2871.

Marks, $^{12}\frac{\text{M R, B}_6}{\text{T, O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	0.	....	
11,250	45,000	.001483	.000183	....	....	
12,500	50,000	.001650	.000167	....	....	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001783	.000016	....	....	
13,500	54,000	.001783	.000050	....	....	
13,750	55,000	.001817	.000034	....	....	
14,000	56,000	.001850	.000033	....	....	
14,250	57,000	.001867	.000017	....	....	
14,500	58,000	.001933	.000066	....	....	
14,750	59,000	.001963	.000030	....	....	
15,000	60,000	.002017	.000034	....	....	
15,250	61,000	.002050	.000033	....	....	Elastic limit.
15,500	62,000	.002167	.000117	....	....	
15,750	63,000	.002333	.000166	....	....	
16,000	64,000	.002533	.000200	....	....	
16,500	66,000	.003500	.000967	....	....	
17,000	68,000	.004833	.001333	....	....	
17,500	70,000	.006417	.001584	....	....	
18,000	72,000	.007833	.001416	....	....	
18,500	74,000	.009500	.001667	....	....	
19,000	76,000	.011000	.001500	....	....	
19,500	78,000	.012517	.001517	....	....	
20,000	80,000	.014083	.001566	....	....	
20,500	82,000	.015833	.001750	....	....	
21,000	84,000	.017500	.001667	....	....	
21,500	86,000	.019500	.002000	....	....	
22,000	88,000	.021583	.002083	....	....	
22,500	90,000	.023333	.001750	....	....	
23,000	92,000	.025333	.002000	....	....	
23,500	94,000	.027917	.002584	....	....	
24,000	96,000	.030833	.002416	....	....	
24,500	98,000	.0333	.002967	....	....	
25,000	100,000	.0367	.0034	....	....	
25,500	102,000	.0417	.0050	....	....	
26,000	104,000	.0467	.0030	....	....	
26,500	106,000	.0500	.0033	....	....	
27,000	108,000	.0617	.0117	....	....	
27,500	110,000	.0767	.0150	....	....	
27,840	111,360	.1033	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	111,360
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1317
Elongation per inch under strain at elastic limit	do....	.002050
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		83.5
Position of rupture		1″.60 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.12, ″.28*, ″.18, ″.11, ″.08, ″.07

No. 2872.

Marks, $^{12\,M\,R_1\,B_6}_{T_3\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001017	.000184	0.		
8,750	35,000	.001183	.000166	0.		
10,000	40,000	.001367	.000184	.000017	.000017	
11,250	45,000	.001550	.000183			
12,500	50,000	.001700	.000150			
12,750	51,000	.001733	.000033			
13,000	52,000	.001783	.000050			
13,250	53,000	.001817	.000034			
13,500	54,000	.001867	.000050			
13,750	55,000	.001900	.000033			
14,000	56,000	.001933	.000033			
14,250	57,000	.001967	.000034			
14,500	58,000	.002017	.000050			
14,750	59,000	.002067	.000050			Elastic limit.
15,000	60,000	.002150	.000083			
15,250	61,000	.002250	.000100			
15,500	62,000	.002617	.000367			
16,000	64,000	.003917	.001300			
16,500	66,000	.005667	.001750			
17,000	68,000	.007333	.001666			
17,500	70,000	.008883	.001550			
18,000	72,000	.010500	.001617			
18,500	74,000	.012000	.001500			
19,000	76,000	.013533	.001533			
19,500	78,000	.015200	.001667			
20,000	80,000	.017083	.001883			
20,500	82,000	.019017	.001934			
21,000	84,000	.020833	.001816			
21,500	86,000	.023000	.002167			
22,000	88,000	.025167	.002167			
22,500	90,000	.027500	.002333			
23,000	92,000	.030333	.002833			
23,500	94,000	.033000	.002667			
24,000	96,000	.0367	.0037			
24,500	98,000	.0400	.0033			
25,000	100,000	.0467	.0067			
25,500	102,000	.0517	.0050			
26,000	104,000	.0600	.0083			
26,500	106,000	.0717	.0117			
26,780	107,120	.0950	.0233			Tensile strength.

General summary.

Tensile strength per square inch of original section....pounds.. 107,120
Elastic limit per square inch of original section....do.... 59,000
Elongation per inch after rupture....inch.. 0.118
Elongation per inch under strain at elastic limit....do.... .002067
Reduction in diameter at point of rupture....do.... .124
Reduction in area after rupture, per centum of original section.... [illegible]
Position of rupture.... ".65 from neck
Character of broken surface....granular, 60 per cent.; silky, 40 per cent
Elongation of inch sections.... ".29, ".11, ".10, ".07, ".06, [illegible]

No. 2873.

Marks, $^{12}\frac{M\ E_1\ B_8}{T_4\ I}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000483	.000183	0.	....	
5,000	20,000	.000650	.000167	0.	....	
6,250	25,000	.000817	.000167	0.	....	
7,500	30,000	.000983	.000166	0.	....	
8,750	35,000	.001150	.000167	0.	....	
10,000	40,000	.001317	.000167	0.	....	
11,250	45,000	.001483	.000166	....	....	
12,500	50,000	.001667	.000184	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001733	.000033	....	....	
13,250	53,000	.001767	.000034	....	....	
13,500	54,000	.001800	.000033	....	....	
13,750	55,000	.001833	.000033	....	....	
14,000	56,000	.001867	.000034	....	....	
14,250	57,000	.001900	.000033	....	....	
14,500	58,000	.001950	.000050	....	....	
14,750	59,000	.001983	.000033	....	....	
15,000	60,000	.002017	.000034	....	....	
15,250	61,000	.002050	.000033	....	....	
15,500	62,000	.002100	.000050	....	....	
15,750	63,000	.002150	.000050	....	....	
16,000	64,000	.002183	.000033	....	....	
16,250	65,000	.002233	.000050	....	....	Elastic limit.
16,500	66,000	.002467	.000234	....	....	
16,750	67,000	.002817	.000350	....	....	
17,000	68,000	.003867	.001050	....	....	
17,500	70,000	.005917	.002050	....	....	
18,000	72,000	.007833	.001916	....	....	
18,500	74,000	.009833	.002000	....	....	
19,000	76,000	.011500	.001667	....	....	
19,500	78,000	.013083	.001583	....	....	
20,000	80,000	.014750	.001667	....	....	
20,500	82,000	.016667	.001917	....	....	
21,000	84,000	.018333	.001666	....	....	
21,500	86,000	.020417	.002084	....	....	
22,000	88,000	.022500	.002083	....	....	
22,500	90,000	.024833	.002333	....	....	
23,000	92,000	.026917	.002084	....	....	
23,500	94,000	.030000	.003083	....	....	
24,000	96,000	.032667	.002667	....	....	
24,500	98,000	.0367	.004033	....	....	
25,000	100,000	.0400	.0033	....	....	
25,500	102,000	.0450	.0050	....	....	
26,000	104,000	.0517	.0067	....	....	
26,500	106,000	.0617	.0100	....	....	
27,000	108,000	.0800	.0183	....	....	
27,240	108,960	.1050	.0250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	108,960
Elastic limit per square inch of original section	do	65,000
Elongation per inch after rupture	inch	0.1500
Elongation per inch under strain at elastic limit	do	.002233
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		2″.70 from neck
Character of broken surface		silky
Elongation of inch sections		″.08, ″.10, ″.12, ″.35*, ″.16, ″.08

BREECH-BLOCK FORGING.

Exterior diameter, 15″.25.
Interior diameter, 3″.00.

No. 3064.

Marks, $^{12\,M\,R_1\,B\,B}_{T_1\,1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000423	.000166	0.		
5,000	20,000	.000600	.000167	0.		
6,250	25,000	.000767	.000167	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001133	.000200	0.		
10,000	40,000	.001367	.000234	.000033	.000033	
10,250	41,000	.001400	.000033			
10,500	42,000	.001433	.000033			
10,750	43,000	.001467	.000034			
11,000	44,000	.001500	.000033			
11,250	45,000	.001567	.000067			Elastic limit.
11,500	46,000	.001700	.000133			
11,750	47,000	.002667	.000967			
12,000	48,000	.003633	.000966			
12,250	49,000	.004667	.001034			
12,500	50,000	.005400	.000738			
13,000	52,000	.006700	.001300			
13,500	54,000	.008333	.001633			
14,000	56,000	.009933	.001600			
14,500	58,000	.011500	.001567			
15,000	60,000	.013333	.001833			
15,500	62,000	.015200	.001867			
16,000	64,000	.016933	.001733			
16,500	66,000	.019000	.002067			
17,000	68,000	.021267	.002267			
17,500	70,000	.023600	.002333			
18,000	72,000	.026000	.002400			
18,500	74,000	.028600	.002600			
19,000	76,000	.031733	.003133			
19,500	78,000	.035000	.003267			
20,000	80,000	.038833	.003833			
20,500	82,000	.041667	.002834			
21,000	84,000	.0450	.003333			
21,500	86,000	.0500	.0050			
22,000	88,000	.0600	.0100			
22,500	90,000	.0700	.0100			
23,000	92,000	.0900	.0200			
23,380	93,520	.1267	.0367			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	93,520
Elastic limit per square inch of original section	do	45,000
Elongation per inch after rupture	inch	0.1733
Elongation per inch under strain at elastic limit	do	.001567
Reduction in diameter at point of rupture	do	.136
Reduction in area after rupture, per centum of original section		14.2
Position of rupture		1″.00 from neck
Character of broken surface		silky, slightly granular
Elongation of inch sections		″.09, ″.29, ″.14

No. 3065.

Marks, $^{12\,M\,B_1\,B\,B}_{T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001333	.000200	.000033	.000033	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001467	.000067	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001533	.000033	....	....	
11,500	46,000	.001567	.000034	....	....	
11,750	47,000	.001600	.000033	....	....	
12,000	48,000	.001633	.000033	....	....	
12,250	49,000	.001700	.000067	....	....	
12,500	50,000	.001767	.000067	....	....	
12,750	51,000	.001833	.000066	....	....	
13,000	52,000	.001867	.000034	....	....	Elastic limit.
13,250	53,000	.002000	.000133	....	....	
13,500	54,000	.002267	.000267	....	....	
13,750	55,000	.002567	.000300	....	....	
14,000	56,000	.003233	.000666	....	....	
14,250	57,000	.003633	.000400	....	....	
14,500	58,000	.004267	.000634	....	....	
14,750	59,000	.004800	.000533	....	....	
15,000	60,000	.005500	.000700	....	....	
15,500	62,000	.006800	.001300	....	....	
16,000	64,000	.008700	.001200	....	....	
16,500	66,000	.009667	.001667	....	....	
17,000	68,000	.011267	.001600	....	....	
17,500	70,000	.012900	.001633	....	....	
18,000	72,000	.014500	.001600	....	....	
18,500	74,000	.016400	.001900	....	....	
19,000	76,000	.018200	.001800	....	....	
19,500	78,000	.020233	.002033	....	....	
20,000	80,000	.022333	.002100	....	....	
20,500	82,000	.024667	.002334	....	....	
21,000	84,000	.027000	.002333	....	....	
21,500	86,000	.029667	.002667	....	....	
22,000	88,000	.032500	.002833	....	....	
22,500	90,000	.035667	.003167	....	....	
23,000	92,000	.039333	.003666	....	....	
23,500	94,000	.0433	.003967	....	....	
24,000	96,000	.0500	.0067	....	....	
24,500	98,000	.0567	.0067	....	....	
25,000	100,000	.0633	.0066	....	....	
25,500	102,000	.0733	.0100	....	....	
25,810	103,240	.0967	.0234	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	**pounds..**	**103,240**
Elastic limit per square inch of original section	**do....**	**52,000**
Elongation per inch after rupture	**inch..**	**0.1000**
Elongation per inch under strain at elastic limit	**do....**	**.001867**
Reduction in diameter at point of rupture	**do....**	**.054**
Reduction in area after rupture, per centum of original section		**18.3**
Position of rupture		**″.90 from neck**
Character of broken surface		**granular; radiating from a dull spot at the circumference**
Elongation of inch sections		**″.07, ″.09, ″.14***

No. 3066.

Marks, $^{12\,\mathrm{M\,R_1\,B\,B}}_{\mathrm{T_2\,M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000867	.000200	0.		
7,500	30,000	.001033	.000166	0.		
8,750	35,000	.001267	.000234	.000033	.000033	
10,000	40,000	.001433	.000166	.000067	.000034	
10,250	41,000	.001467	.000034			
10,500	42,000	.001500	.000033			
10,750	43,000	.001567	.000067			
11,000	44,000	.001600	.000033			
11,250	45,000	.001633	.000033			
11,500	46,000	.001700	.000067			
11,750	47,000	.001733	.000033			Elastic limit.
12,000	48,000	.002033	.000300			
12,250	49,000	.002967	.000934			
12,500	50,000	.004333	.001366			
13,000	52,000	.005567	.001234			
13,500	54,000	.007000	.001433			
14,000	56,000	.008500	.001500			
14,500	58,000	.010200	.001700			
15,000	60,000	.012000	.001800			
15,500	62,000	.013667	.001667			
16,000	64,000	.015333	.001666			
16,500	66,000	.017167	.001834			
17,000	68,000	.019167	.002000			
17,500	70,000	.021467	.002300			
18,000	72,000	.024000	.002533			
18,500	74,000	.026367	.002367			
19,000	76,000	.029167	.002800			
19,500	78,000	.032333	.003166			
20,000	80,000	.035333	.003000			
20,500	82,000	.039667	.004334			
21,000	84,000	.044067	.004400			
21,500	86,000	.0500	.005933			
22,000	88,000	.0567	.0067			
22,500	90,000	.0633	.0066			
23,000	92,000	.0733	.0100			
23,500	94,000	.0933	.0200			
23,700	94,800	.1200	.0267			Tensile strength.

General summary.

Specific gravity		7.8504
Hardness		17.62
Tensile strength per square inch of original section	pounds	94,800
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.1233
Elongation per inch under strain at elastic limit	do	.001733
Reduction in diameter at point of rupture	do	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		".5 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		".10, ".11, ".16

BREECH-BLOCK, NEW FORGING.

No. 3228.

Marks, $\mathrm{^{12\,M\,R_1\,B\,B}_{T_4\,I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.001000	.000200	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001333	.000166	0.	....	
11,250	45,000	.001533	.000200	....	....	
12,500	50,000	.001700	.000167	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	
13,250	53,000	.001833	.000066	....	....	
13,500	54,000	.001900	.000067	....	....	Elastic limit.
13,750	55,000	.007000	.005100	....	....	
14,000	56,000	.007467	.000467	....	....	
14,250	57,000	.008500	.001033	....	....	
14,500	58,000	.009333	.000833	....	....	
14,750	59,000	.010100	.000767	....	....	
15,000	60,000	.011033	.000933	....	....	
15,500	62,000	.013233	.002200	....	....	
16,000	64,000	.015000	.001767	....	....	
16,500	66,000	.017333	.002333	....	....	
17,000	68,000	.019167	.001834	....	....	
17,500	70,000	.021667	.002500	....	....	
18,000	72,000	.024333	.002666	....	....	
18,500	74,000	.026900	.002567	....	....	
19,000	76,000	.030000	.003100	....	....	
19,500	78,000	.033333	.003333	....	....	
20,000	80,000	.0367	.003367	....	....	
20,500	82,000	.0400	.0033	....	....	
21,000	84,000	.0467	.0067	....	....	
21,500	86,000	.0533	.0066	....	....	
22,000	88,000	.0600	.0067	....	....	
22,500	90,000	.0700	.0100	....	....	
23,000	92,000	.0900	.0200	....	....	
23,300	93,200	.1100	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	93,200
Elastic limit per square inch of original section	do ...	54,000
Elongation per inch after rupture	inch..	0.1133
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		″.1 from neck
Character of broken surface		granular; dull spot at circumference
Elongation of inch sections		″.13*, ″.12, ″.09

No. 8229.

Marks, ^{12}M R, B B T, O
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000767	.000200	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001267	.000134	0.	....	
11,250	45,000	.001400	.000133	....	....	
12,500	50,000	.001600	.000200	....	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001733	.000066	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	....	....	
14,000	56,000	.001833	.000033	....	....	Elastic limit.
14,250	57,000	.002900	.001067	....	....	
14,500	58,000	.004867	.001967	....	....	
14,750	59,000	.006033	.001166	....	....	
15,000	60,000	.006767	.000734	....	....	
15,500	62,000	.008600	.001833	....	....	
16,000	64,000	.010200	.001600	....	....	
16,500	66,000	.012033	.001833	....	....	
17,000	68,000	.013767	.001734	....	....	
17,500	70,000	.015500	.001733	....	....	
18,000	72,000	.017500	.002000	....	....	
18,500	74,000	.019600	.002100	....	....	
19,000	76,000	021733	.002133	....	....	
19,500	78,000	.024033	.002300	....	....	
20,000	80,000	.026367	.002334	....	....	
20,500	82,000	.029433	.003066	....	....	
21,000	84,000	.033033	.003600	....	....	
21,500	86,000	.035100	.002067	....	....	
22,000	88,000	.0400	.0049	....	....	
22,500	90,000	.0433	.0033	....	....	
23,000	92,000	.0500	.0067	....	....	
23,500	94,000	.0600	.0100	....	....	
24,000	96,000	.0667	.0067	....	....	
24,500	98,000	.0767	.0100	....	....	
25,000	100,000	.1100	.0333	....	....	
25,100	100,400	.1583	.0283	....	....	Tensile strength.

General summary.

Specific gravity	7.[illegible]
Hardness	21.[illegible]
Tensile strength per square inch of original section .... pounds	100,400
Elastic limit per square inch of original section .... do	56,000
Elongation per inch after rupture .... inch	0.1583
Elongation per inch under strain at elastic limit .... do	.001833
Reduction in diameter at point of rupture .... do	.144
Reduction in area after rupture, per centum of original section	44.6
Position of rupture	".95 from neck
Character of broken surface	silky, interspersed with fine granulation
Elongation of inch sections	".30, ".17, ".12

No. 3230.

Marks, ^{12}M B, B B T, M
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000633	.000200	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001167	.000200	0.		
10,000	40,000	.001333	.000166	0.		
11,250	45,000	.001533	.000200			
12,500	50,000	.001733	.000200			
12,750	51,000	.001767	.000034			
13,000	52,000	.001800	.000033			Elastic limit.
13,250	53,000	.002000	.000200			
13,500	54,000	.002833	.000833			
13,750	55,000	.003867	.001034			
14,000	56,000	.005933	.002066			
14,250	57,000	.007533	.001600			
14,500	58,000	.007933	.000400			
14,750	59,000	.008867	.000934			
15,000	60,000	.009567	.000700			
15,500	62,000	.011433	.001866			
16,000	64,000	.013267	.001834			
16,500	66,000	.014900	.001633			
17,000	68,000	.016767	.001867			
17,500	70,000	.019100	.002333			
18,000	72,000	.021200	.002100			
18,500	74,000	.023600	.002400			
19,000	76,000	.026267	.002667			
19,500	78,000	.029233	.002966			
20,000	80,000	.032433	.003400			
20,500	82,000	.035000	.002567			
21,000	84,000	.038333	.003333			
21,500	86,000	.041667	.003334			
22,000	88,000	.0500	.008334			
22,500	90,000	.0600	.0100			
23,000	92,000	.0700	.0100			
23,500	94,000	.0833	.0133			
23,900	95,600	.1267	.0434			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	95,600
Elastic limit per square inch of original section	do ...	52,000
Elongation per inch after rupture	inch..	0.1667
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.50 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.08, ″11, ″31*

GAS CHECK RING FORGING.

Exterior diameter, 13".
Interior diameter 3".5.

No. 2840.

Marks, $^{12\,M\,R_1\,G\,R}_{T,\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000300	.000133	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001067	.000134	....	....	
10,000	40,000	.001233	.000166	....	....	
11,2 0	45,000	.001367	.000134	....	....	
11,500	46,000	.001400	.000033	....	....	
11,750	47,000	.001433	.000033	....	....	Elastic limit.
12,000	48,000	.001567	.000134	....	....	
12,250	49,000	.002233	.000666	....	....	
12,500	50,000	.002967	.000734	....	....	
12,750	51,000	.003667	.000700	....	....	
13,000	52,000	.004333	.000666	....	....	
13,250	53,000	.004933	.000600	....	....	
13,500	54,000	.005667	.000734	....	....	
14,000	56,000	.007467	.001800	....	....	
14,500	58,000	.009000	.001533	....	....	
15,000	60,000	.010733	.001733	....	....	
15,500	62,000	.012600	.001867	....	....	
16,000	64,000	.014667	.002067	....	....	
16,500	66,000	.016600	.001933	....	....	
17,000	68,000	.018267	.001667	....	....	
17,500	70,000	.020400	.002133	....	....	
18,000	72,000	.022700	.002300	....	....	
18,500	74,000	.025067	.002367	....	....	
19,000	76,000	.027833	.002766	....	....	
19,500	78,000	.030733	.002900	....	....	
20,000	80,000	.034000	.003267	....	....	
20,500	82,000	.037833	.003833	....	....	
21,000	84,000	.042667	.004834	....	....	
21,500	86,000	.046500	.003833	....	....	
22,000	88,000	.0533	.0068	....	....	
22,500	90,000	.0600	.0067	....	....	
23,000	92,000	.0667	.0067	....	....	
23,500	94,000	.0867	.0200	....	....	
23,820	95,280	.1233	.0366	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 95,280
Elastic limit per square inch of original section....................................do ... 47,000
Elongation per inch after rupture....................................inch.. 0.2[illegible]
Elongation per inch under strain at elastic limit....................................do.... .001433
Reduction in diameter at point of rupture....................................do.... .164
Reduction in area after rupture, per centum of original section.................................... 44.6
Position of rupture.................................... 1".4 from neck
Character of broken surface....................................silky
Elongation of inch sections....................................".17, ".39, ".11

No. 2841.

Marks, $^{12\,\text{M R, G R}}_{\text{T}_2\,\text{O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000567	.000134	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001100	.000200	....	....	
10,000	40,000	.001267	.000167	....	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001433	.000066	....	....	
11,250	45,000	.001467	.000034	....	....	
11,500	46,000	.001500	.000033	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001600	.000067	....	....	
12,250	49,000	.001600	0.	....	....	
12,500	50,000	.001700	.000100	....	....	
12,750	51,000	.001733	.000033	....	....	
13,000	52,000	.001767	.000034	....	....	Elastic limit.
13,250	53,000	.002167	.000400	....	....	
13,500	54,000	.003100	.000933	....	....	
13,750	55,000	.003667	.000567	....	....	
14,000	56,000	.004333	.000666	....	....	
14,250	57,000	.004933	.000600	....	....	
14,500	58,000	.005667	.000734	....	....	
14,750	59,000	.006233	.000566	....	....	
15,000	60,000	.007100	.000867	....	....	
15,500	62,000	.008900	.001800	....	....	
16,000	64,000	.010433	.001533	....	....	
16,500	66,000	.012167	.001734	....	....	
17,000	68,000	.014000	.001833	....	....	
17,500	70,000	.015800	.001800	....	....	
18,000	72,000	.017667	.001867	....	....	
18,500	74,000	.019667	.002000	....	....	
19,000	76,000	.021833	.002166	....	....	
19,500	78,000	.024000	.002167	....	....	
20,000	80,000	.026333	.002333	....	....	
20,500	82,000	.029167	.002834	....	....	
21,000	84,000	.032167	.003000	....	....	
21,500	86,000	.035500	.003333	....	....	
22,000	88,000	.039000	.003500	....	....	
22,500	90,000	.043167	.004167	....	....	
23,000	92,000	.048333	.005166	....	....	
23,500	94,000	.0533	.004967	....	....	
24,000	96,000	.0633	.0100	....	....	
24,500	98,000	.0700	.0067	....	....	
25,000	100,000	.1000	.0300	....	....	
25,060	100,240	.1133	.0133	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 100,240
Elastic limit per square inch of original section....................................do.... 52,000
Elongation per inch after rupture....................................inch.. 0.1933
Elongation per inch under strain at elastic limit....................................do.... .001767
Reduction in diameter at point of rupture....................................do.... .114
Reduction in area after rupture, per centum of original section.................................... 36.4
Position of rupture.................................... 1″.25 from neck
Character of broken surface....................................silky; trace of granulation
Elongation of inch sections.................................... ″.25*. ″.21*, ″.12

No. 2842.

Marks, $^{12}\underset{\text{T}_1\text{M}}{\text{M E}}{}^{\text{G R}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.		Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000233	.000133	0.		
3,750	15,000	.000400	.000167	0.		
5,000	20,000	.000533	.000133	0.		
6,250	25,000	.000700	.000167	0.		
7,500	30,000	.000867	.000167	0.		
8,750	35,000	.001067	.000200			
10,000	40,000	.001267	.000200			
10,250	41,000	.001300	.000033			
10,500	42,000	.001333	.000033			
10,750	43,000	.001400	.000067			
11,000	44,000	.001467	.000067			
11,250	45,000	.001500	.000033			
11,500	46,000	.001533	.000033			
11,750	47,000	.001567	.000034			
12,000	48,000	.001600	.000033			
12,250	49,000	.001633	.000033			
12,500	50,000	.001667	.000034			Elastic limit.
12,750	51,000	.001800	.000133			
13,000	52,000	.002800	.001000			
13,250	53,000	.003400	.000600			
13,500	54,000	.004333	.000933			
13,750	55,000	.004833	.000500			
14,000	56,000	.005838	.001000			
14,250	57,000	.006333	.000500			
14,500	48,000	.007333	.001000			
14,750	59,000	.008167	.000834			
15,000	60,000	.009067	.000900			
15,500	62,000	.010667	.001600			
16,000	64,000	.012267	.001600			
16,500	66,000	.014167	.001900			
17,000	68,000	.016333	.002166			
17,500	70,000	.018167	.001834			
18,000	72,000	.020033	.001866			
18,500	74,000	.022333	.002300			
19,000	76,000	.024600	.002267			
19,500	78,000	.027333	.002733			
20,000	80,000	.030167	.002834			
20,500	82,000	.033033	.002866			
21,000	84,000	.036667	.003634			
21,500	86,000	.040267	.003600			
22,000	88,000	.044933	.004666			
22,500	90,000	.0533	.008367			
23,000	92,000	.0600	.0067			
23,500	94,000	.0667	.0067			
24,000	96,000	.0833	.0166			
24,500	98,000	.1233	.0400			Tensile strength.

General summary.

Specific gravity		7.8863
Hardness		12.28
Tensile strength per square inch of original section	pounds	98,000
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.1233
Elongation per inch under strain at elastic limit	do	.001667
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.0
Position of rupture		1″.5 from neck
Character of broken surface		silky
Elongation of inch sections		″.12, ″.33*, ″.12

No. 2899.

Marks, $^{12}\text{M R}_{\text{T}_4\,\text{I}}\text{G R}$
Diameter, ."564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000500	.000200	0.	....	
5, 000	20, 000	.000633	.000133	0.	....	
6, 250	25, 000	.000867	.000234	0.	....	
7, 500	30, 000	.001033	.000166	0.	....	
8, 750	35, 000	.001200	.000167	0.	....	
10, 000	40, 000	.001367	.000167	0.	....	
11, 250	45, 000	.001533	.000166	....	....	
12, 500	50, 000	.001700	.000167	....	....	
12, 750	51, 000	.001733	.000033	....	....	
13, 000	52, 000	.001800	.000067	....	....	
13, 250	53, 000	.001833	.000033	....	....	
13, 500	54, 000	.001867	.000034	....	....	
13, 750	55, 000	.001900	.000033	....	....	
14, 000	56, 000	.001933	.000033	....	....	
14, 250	57, 000	.001967	.000034	....	....	
14, 500	58, 000	.002000	.000033	....	....	
14, 750	59, 000	.002100	.000100	....	....	
15, 000	60, 000	.002167	.000067	....	....	
15, 250	61, 000	.002233	.000066	....	....	
15, 500	62, 000	.002300	.000067	....	....	Elastic limit.
15, 750	63, 000	.002467	.000167	....	....	
16, 000	64, 000	.002633	.000166	....	....	
16, 250	65, 000	.003000	.000367	....	....	
16, 500	66, 000	.003333	.000333	....	....	
17, 000	68, 000	.004533	.001200	....	....	
17, 500	70, 000	.006133	.001600	....	....	
18, 000	72, 000	.007333	.001200	....	....	
18, 500	74, 000	.009200	.001867	....	....	
19, 000	76, 000	.010833	.001633	....	....	
19, 500	78, 000	.012667	.001834	....	....	
20, 000	80, 000	.014433	.001766	....	....	
20, 500	82, 000	.016100	.001667	....	....	
21, 000	84, 000	.018000	.001900	....	....	
21, 500	86, 000	.020000	.002000	....	....	
22, 000	88, 000	.022167	.002167	....	....	
22, 500	90, 000	.024500	.002333	....	....	
23, 000	92, 000	.026733	.002233	....	....	
23. 500	94, 000	.029200	.002467	....	....	
24, 000	96, 000	.031667	.002467	....	....	
24, 500	98. 000	.034833	.003166	....	....	
25, 000	100, 000	.037667	.002834	....	....	
25, 500	102, 000	.042000	.004333	....	....	
26, 000	104, 000	.0467	.0047	....	....	
26, 500	106, 000	.0533	.0066	....	....	
27, 000	108, 000	.0633	.0100	....	....	
27, 500	110, 000	.0767	.0134	....	....	
27, 630	110, 520	.1000	.0233	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	110, 520
Elastic limit per square inch of original section	do....	62, 000
Elongation per inch after rupture	inch..	0. 1667
Elongation per inch under strain at elastic limit	do....	.002300
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		1".50 from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		".13, ".27*, ".10

No. 2900.

Marks, ^{12} M $\underset{T_s O}{R_1}$ G R
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200	0.		
2,000	10,000	.000350	.000150	0.		
3,000	15,000	.000500	.000150	0.		
4,000	20,000	.000650	.000150	0.		
5,000	25,000	.000850	.000200	0.		
6,000	30,000	.001000	.000150	0.		
7,000	35,000	.001150	.000150	0.		
8,000	40,000	.001350	.000200	0.		
9,000	45,000	.001550	.000200			
10,000	50,000	.001750	.000200			
10,200	51,000	.001800	.000050			
10,400	52,000	.001850	.000050			
10,600	53,000	.001900	.000050			
10,800	54,000	.001950	.000050			
11,000	55,000	.002000	.000050			
11,200	56,000	.002050	.000050			
11,400	57,000	.002100	.000050			
11,600	58,000	.002150	.000050			
11,800	59,000	.002200	.000050			
12,000	60,000	.002250	.000050			Elastic limit.
12,200	61,000	.002400	.000150			
12,400	62,000	.002550	.000150			
12,600	63,000	.002800	.000250			
12,800	64,000	.003000	.000200			
13,000	65,000	.003500	.000500			
13,200	66,000	.003850	.000350			
13,600	68,000	.005000	.001250			
14,000	70,000	.006500	.001500			
14,400	72,000	.007750	.001250			
14,800	74,000	.009200	.001450			
15,200	76,000	.010650	.001450			
15,600	78,000	.012250	.001600			
16,000	80,000	.013900	.001650			
16,400	82,000	.015250	.001350			
16,800	84,000	.017000	.001750			
17,200	86,000	.018500	.001500			
17,600	88,000	.020250	.001750			
18,000	90,000	.022100	.001850			
18,400	92,000	.024250	.002150			
18,800	94,000	.026550	.002300			
19,200	96,000	.028750	.002200			
19,600	98,000	.031300	.002550			
20,000	100,000	.033850	.002550			
20,400	102,000	.037150	.003300			
20,800	104,000	.040750	.003600			
21,200	106,000	.045000	.004250			
21,600	108,000	.050500	.005500			
22,000	110,000	.0550	.0045			
22,400	112,000	.0650	.0100			
22,790	113,950	.1000	.0350			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	113,950
Elastic limit per square inch of original section	do	60,000
Elongation per inch after rupture	inch	0.1650
Elongation per inch under strain at elastic limit	do	.002250
Reduction in diameter at point of rupture	do	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		1″ from neck
Character of broken surface		granular at circumference; silky center
Elongation of inch sections		″.20*, ″.13

FACE-PLATE FORGING.

No. 2960.

Marks, $^{12\,M\,\frac{R}{1},\,F\,P}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	......	
2,500	10,000	.000333	.000166	0.	......	
3,750	15,000	.000500	.000167	0.	......	
5,000	20,000	.000700	.000200	0.	......	
6,250	25,000	.000867	.000167	0.	......	
7,500	30,000	.001033	.000166	0.	......	
8,750	35,000	.001200	.000167	......	......	
10,000	40,000	.001367	.000167	......	......	
11,250	45,000	.001533	.000166	......	......	
11,500	46,000	.001567	.000034	......	......	
11,750	47,000	.001600	.000033	......	......	
12,000	48,000	.001667	.000067	......	......	Elastic limit.
12,250	49,000	.002267	.000600	......	......	
12,500	50,000	.002600	.000333	......	......	
12,750	51,000	.002900	.000300	......	......	
13,000	52,000	.003400	.000500	......	......	
13,250	53,000	.003833	.000433	......	......	
13,500	54,000	.004333	.000500	......	......	
13,750	55,000	.004767	.000434	......	......	
14,000	56,000	.005433	.000666	......	......	
14,250	57,000	.006000	.000567	......	......	
14,500	58,000	.006700	.000700	......	......	
14,750	59,000	.007333	.000633	......	......	
15,000	60,000	.008167	.000834	......	......	
15,500	62,000	.009667	.001500	......	......	
16,000	64,000	.011033	.001366	......	......	
16,500	66,000	.012667	.001634	......	......	
17,000	68,000	.014333	.001666	......	......	
17,500	70,000	.015833	.001500	......	......	
18,000	72,000	.018000	.002167	......	......	
18,500	74,000	.020000	.002000	......	......	
19,000	76,000	.021833	.001833	......	......	
19,500	78,000	.024000	.002167	......	......	
20,000	80,000	.026167	.002167	......	......	
20,500	82,000	.028333	.002166	......	......	
21,000	84,000	.030667	.002334	......	......	
21,500	86,000	.034000	.003333	......	......	
22,000	88,000	.036667	.002667	......	......	
22,500	90,000	.040000	.003333	......	......	
23,000	92,000	.0433	.0033	......	......	
23,500	94,000	.0467	.0034	......	......	
24,000	96,000	.0533	.0066	......	......	
24,500	98,000	.0633	.0100	......	......	
25,000	100,000	.0767	.0134	......	......	
25,480	101,920	.1067	.0300	......	......	Tensile strength.

General summary.

Specific gravity		7.8569
Hardness		20.03
Tensile strength per square inch of original section	pounds	101,920
Elastic limit per square inch of original section	do	48,000
Elongation per inch after rupture	inch	0.1433
Elongation per inch under strain at elastic limit	do	.001667
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.70 from neck
Character of broken surface		granular; silky center
Elongation of inch sections		″.25*, ″.11, ″.07

No. 2961.

Marks, $^{12}\mathrm{M\,B_1\,F\,P}_{2}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000533	.000200	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000900	.000200	0.	....	
7,500	30,000	.001067	.000167	0.	....	
8,750	35,000	.001283	.000166	....	....	
10,000	40,000	.001433	.000200	....	....	
10,250	41,000	.001467	.000034	....	....	
10,500	42,000	.001500	.000033	....	....	
10,750	43,000	.001533	.000033	....	....	
11,000	44,000	.001567	.000034	....	....	
11,250	45,000	.001600	.000033	....	....	
11,500	46,000	.001667	.000067	....	....	
11,750	47,000	.001733	.000066	....	....	
12,000	48,000	.001767	.000034	....	....	
12,250	49,000	.001833	.000066	....	....	
12,500	50,000	.001933	.000100	....	....	Elastic limit.
12,750	51.000	.002100	.000167	....	....	
13,000	52,000	.002300	.000200	....	....	
13,250	53,000	.002467	.000167	....	....	
13,500	54,000	.002667	.000200	....	....	
13,750	55,000	.003000	.000333	....	....	
14,000	56,000	.003367	.000367	....	....	
14,250	57,000	.003700	.000333	....	....	
14,500	58.000	.004267	.000567	....	....	
14,750	59,000	.004833	.000566	....	....	
15,000	60,000	.005500	.000667	....	....	
15,500	62,000	.006767	.001267	....	....	
16,000	64,000	.008167	.001400	....	....	
16,500	66,000	.009667	.001500	....	....	
17,000	68,000	.011167	.001500	....	....	
17,500	70,000	.012667	.001500	....	....	
18,000	72,000	.014167	.001500	....	....	
18,500	74,000	,016000	.001833	....	....	
19,000	76,000	,017667	.001667	....	....	
19,500	78,000	.019833	.002166	....	....	
20,000	80,000	.021667	.001834	....	....	
20,500	82,000	.023500	.001833	....	....	
21,000	84,000	.026000	.002500	....	....	
21,500	86,000	.028333	.002333	....	....	
22,000	88,000	.030567	.002234	....	....	
22,500	90,000	.033667	.003100	....	....	
23,000	92,000	.036667	.003000	....	....	
23,500	94,000	.040000	.003333	....	....	
24,000	96,000	.0433	.0033	....	....	
24,500	98,000	.0467	.0034	....	....	
25,000	100,000	.0567	.0100	....	....	
25,500	102,000	.0667	.0100	....	....	
26,000	104,000	.0767	.0100	....	....	
26,260	105,040	.1033	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 105,040
Elastic limit per square inch of original section .... do.... 50,000
Elongation per inch after rupture .... inch.. 0.133
Elongation per inch under strain at elastic limit .... do.... .001933
Reduction in diameter at point of rupture .... do.... .094
Reduction in area after rupture, per centum of original section 30.6
Position of rupture .... ″.75 from neck
Character of broken surface .... granular; silky center
Elongation of inch sections .... ″.22*, ″.11, ″.07

SPINDLE FORGING.

Diameter, 12″.75.

No. 3202.

Marks, $^{12\,M\,R,\,S\,P}_{T,\,1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001167	.000167	0.	....	
10,000	40,000	.001833	.000166	0.	....	
11,250	45,000	.001500	.000167	....	....	
12,500	50,000	.001667	.000167	....	....	
12,750	51,000	.001700	.000033	....	....	
13,000	52,000	.001767	.000067	....	....	
13,250	53,000	.001833	.000066	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001900	.000033	....	....	
14,000	56,000	.001967	.000067	....	....	
14,250	57,000	.002000	.000033	....	....	Elastic limit.
14,500	58,000	.002100	.000100	....	....	
14,750	59,000	.002267	.000167	....	....	
15,000	60,000	.003000	.000733	....	....	
15,250	61,000	.003767	.000767	....	....	
15,500	62,000	.005000	.001233	....	....	
16,000	64,000	.006667	.001667	....	....	
16,500	66,000	.008200	.001533	....	....	
17,000	68,000	.009833	.001633	....	....	
17,500	70,000	.011533	.001700	....	....	
18,000	72,000	.013333	.001800	....	....	
18,500	74,000	.014667	.001334	....	....	
19,000	76,000	.016500	.001833	....	....	
19,500	78,000	.018500	.002000	....	....	
20,000	80,000	.020400	.001900	....	....	
20,500	82,000	.022367	.001967	....	....	
21,000	84,000	.024500	.002133	....	....	
21,500	86,000	.027067	.002567	....	....	
22,000	88,000	.029367	.002300	....	....	
22,500	90,000	.032167	.002800	....	....	
23,000	92,000	.035333	.003166	....	....	
23,500	94,000	.038667	.003334	....	....	
24,000	96,000	.0417	.003033	....	....	
24,500	98,000	.0467	.0050	....	....	
25,000	100,000	.0533	.0066	....	....	
25,500	102,000	.0600	.0067	....	....	
26,000	104,000	.0667	.0067	....	....	
26,500	106,000	.0867	.0200	....	....	
26,740	106,960	.1233	.0366	....	....	Tensile strength.

General summary.

Specific gravity	7.8500
Hardness	21.76
Tensile strength per square inch of original section ....pounds..	106,960
Elastic limit per square inch of original section ....do....	57,000
Elongation per inch after rupture ....inch..	0.1967
Elongation per inch under strain at elastic limit ....do....	.002000
Reduction in diameter at point of rupture ....do....	.134
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	1″.25 from neck
Character of broken surface	silky, interspersed with fine granulation
Elongation of inch sections	″.12, ″.22*, ″.25*

No. 3203.

Marks, $^{12\,M\,R_1\,S\,P}_{\quad T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.001000	.000200	0.	....	
8, 750	35, 000	.001133	.000133	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001767	.000067	....	....	
13, 500	54, 000	.001800	.000033	....	....	
13, 750	55, 000	.001833	.000033	....	....	
14, 000	56, 000	.001933	.000100	....	....	
14, 250	57, 000	.001967	.000034	....	....	Elastic limit.
14, 500	58, 000	.002100	.000133	....	....	
14, 750	59, 000	.002433	.000333	....	....	
15, 000	60, 000	.003233	.000800	....	....	
15, 500	62, 000	.004900	.001667	....	....	
16, 000	64, 000	.006567	.001667	....	....	
16, 500	66, 000	.008267	.001700	....	....	
17, 000	68, 000	.010000	.001733	....	....	
17, 500	70, 000	.011867	.001867	....	....	
18, 000	72, 000	.013567	.001700	....	....	
18, 500	74, 000	.015600	.002033	....	....	
19, 000	76, 000	.017400	.001800	....	....	
19, 500	78, 000	.019667	.002267	....	....	
20, 000	80, 000	.021733	.002066	....	....	
20, 500	82, 000	.024000	.002267	....	....	
21, 000	84, 000	.026400	.002400	....	....	
21, 500	86, 000	.029167	.002767	....	....	
22, 000	88, 000	.032333	.003166	....	....	
22, 500	90, 000	.035500	.003167	....	....	
23, 000	92, 000	.039333	.003833	....	....	
23, 500	94, 000	.042933	.003600	....	....	
24, 000	96, 000	.0467	.003767	....	....	
24, 500	98, 000	.0533	.0066	....	....	
25, 000	100, 000	.0633	.0100	....	....	
25, 500	102, 000	.0800	.0167	....	....	
25, 670	102, 680	.1000	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	102, 680
Elastic limit per square inch of original section	do	57, 000
Elongation per inch after rupture	inch	0. 1667
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section	do	47.2
Position of rupture		1″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.20, ″.15, ″.07

No. 3204.

Marks, $^{12\,\mathrm{M\,R_1\,S\,P}}_{\mathrm{T_2\,M}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
350	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	,000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	0.	....	
11, 250	45, 000	.001467	.000167	....	....	
12, 500	50, 000	.001633	.000166	....	....	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001767	.000067	....	....	
13, 500	54, 000	.001833	.000066	....	....	
13, 750	55, 000	.001867	.000034	....	....	
14, 000	56, 000	.001900	.000033	....	....	
14, 250	57, 000	.001967	.000067	....	....	Elastic limit.
14, 500	58, 000	.002100	.000133	....	....	
14, 750	59, 000	.002300	.000200	....	....	
15, 000	60, 000	.002700	.000400	....	....	
15, 500	62, 000	.004400	.001700	....	....	
16, 000	64, 000	.006333	.001933	....	....	
16, 500	66, 000	.008000	.001667	....	....	
17, 000	68, 000	.009667	.001667	....	....	
17, 500	70, 000	.011167	.001500	....	....	
18, 000	72, 000	.012767	.001600	....	....	
18, 500	74, 000	.014533	.001766	....	....	
19, 000	76, 000	.016067	.001534	....	....	
19, 500	78, 000	.018000	.001933	....	....	
20, 000	80, 000	.020000	.002000	....	....	
20, 500	82, 000	.021800	.001800	....	....	
21, 000	84, 000	.024167	.002367	....	....	
21, 500	86, 000	.026500	.002333	....	....	
22, 000	88, 000	.029000	.002500	....	....	
22, 500	90, 000	.031500	.002500	....	....	
23, 000	92, 000	.034667	.003167	....	....	
23, 500	94, 000	.038167	.003500	....	....	
24, 000	96, 000	.042000	.003833	....	....	
24, 500	98, 000	.0467	.0047	....	....	
25, 000	100, 000	.0533	.0066	....	....	
25, 500	102, 000	.0600	.0067	....	....	
26, 000	104, 000	.0667	.0067	....	....	
26, 500	106, 000	.0833	.0166	....	....	
26, 790	107, 160	.1133	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	107,160
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0. 1667
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		".70 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		".28,* ".12, ".10

HINGE-PIN FORGING.

No. 2942.

Marks, ^{12} M $\overset{R_1}{L_1}$ H P
Diameter, ″.564.
Sectional area, ″.25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000967	.000234	0.	....	
8,750	35,000	.001100	.000133	0.	....	
10,000	40,000	.001267	.000167	....	....	
11,250	45,000	.001433	.000166	....	....	
12,500	50,000	.001600	.000167	....	....	
13,750	55,000	.001733	.000133	....	....	
14,000	56,000	.001767	.000034	....	....	
14,250	57,000	.001800	.000033	....	....	
14,500	58,000	.001833	.000033	....	....	
14,750	59,000	.001867	.000034	....	....	
15,000	60,000	.001900	.000033	....	....	
15,250	61,000	.001933	.000033	....	....	
15,500	62,000	.001967	.000034	....	....	
15,750	63,000	.002000	.000033	....	....	
16,000	64,000	.002033	.000033	....	....	
16,250	65,000	.002067	.000034	....	....	
16,500	66,000	.002133	.000066	....	....	Elastic limit.
16,750	67,000	.002233	.000100	....	....	
17,000	68,000	.002533	.000300	....	....	
17,250	69,000	.002833	.000300	....	....	
17,500	70,000	.003400	.000567	....	....	
17,750	71,000	.003833	.000433	....	....	
18,000	72,000	.004400	.000567	....	....	
18,250	73,000	.005067	.000667	....	....	
18,500	74,000	.005700	.000633	....	....	
18,750	75,000	.006400	.000700	....	....	
19,000	76,000	.007067	.000667	....	....	
19,500	78,000	.008800	.001733	....	....	
20,000	80,000	.010300	.001500	....	....	
20,500	82,000	.011933	.001633	....	....	
21,000	84,000	.013500	.001567	....	....	
21,500	86,000	.014967	.001467	....	....	
22,000	88,000	.016733	.001766	....	....	
22,500	90,000	.018300	.001567	....	....	
23,000	92,000	.020467	.002167	....	....	
23,500	94,000	.022400	.001933	....	....	
24,000	96,000	.024400	.002000	....	....	
24,500	98,000	.027233	.002833	....	....	
25,000	100,000	.029633	.002400	....	....	
25,500	102,000	.0333	.003667	....	....	
26,000	104,000	.0367	.0034	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0433	.0033	....	....	
27,500	110,000	.0467	.0034	....	....	
28,000	112,000	.0533	.0066	....	....	
28,500	114,000	.0633	.0100	....	....	
29,000	116,000	.0800	.0167	....	....	
29,200	116,800	.1067	.0267	....	....	Tensile strength.

General summary.

Specific gravity		7.829
Hardness		23.6
Tensile strength per square inch of original section	pounds	116,800
Elastic limit per square inch of original section	do	66,000
Elongation per inch after rupture	inch	0.1067
Elongation per inch under strain at elastic limit	do	.002133
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		26.4
Position of rupture		.9 from neck
Character of broken surface		granular; dull center
Elongation of inch sections		".33", ".11 ".07

TABULATION OF TENSION SPECIMENS FROM 12″ B. L. RIFLED MORTAR.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per cent.*				
2990	Cast-iron body	Inside		26,000			Granular; mottled			Breech end.
2991	do	do		27,780			do			Do.
2992	do	do		25,000			do			Muzzle end.
2993	do	do		25,740			do			Do.
2854	Trunnion hoop	Inside	60,000	110,120	17.2	36.4	Silky and fine granulation			One end.
2855	do	Outside	60,000	107,760	13.0	41.9	Silky; trace of granulation	7.8533	23.43	Do.
2856	do	Middle	53,000	104,820	12.3	27.6	Granular; silky spot	7.8577	20.93	Do.
2857	do	do	57,000	105,600	13.8	36.4	Granular; silky center			Do.
2858	do	do	56,000	103,960	14.7	36.4	Granular, 75 per cent.; silky, 25 per cent	7.8540	21.17	Other end.
2859	do	do	55,000	100,000	15.0	49.7	Silky			Do.
2860	do	Outside	53,000	99.680	16.3	30.6	Granular; silky spot	7.8580	19.70	Do.
2861	do	Inside	53,000	102,080	15.3	41.9	Silky; trace of granulation			Do.
2866	Hoop A₃	Middle	63,000	110,160	14.0	44.6	Silky	7.8504	25.43	
2867	do	Outside	67,000	116,240	12.2	41.9	Silky; trace of granulation			
2868	do	Middle	58,000	104,000	14.3	47.2	Silky			
2869	do	Inside	64,000	111,560	13.0	41.9	Silky; slightly granular			
2874	Hoop A₄	Middle	58,000	105,000	14.5	41.9	Silky	7.8507	22.52	
2875	do	Outside	64,000	111,120	13.3	44.6	do			
2876	do	Middle	58,000	104,520	15.2	47.2	do			
2877	do	Inside	58,000	98,600	15.7	49.7	do			
2982	Hoop A₅	Middle	53,000	97,120	17.5	52.2	do	7.8498	20.25	
2983	do	Outside	59,000	104,480	16.2	49.7	do			
2984	do	Middle	55,000	98,560	17.2	49.7	do			
2985	do	Inside	55,000	96,760	16.0	49.7	do			
2986	Hoop A₆	Middle	58,000	103,000	17.0	49.7	do	7.8484	21.89	
2987	do	Outside	50,000	101.200	13.0	52.2	do			
2988	do	Middle	59,000	104,240	15.0	49.7	do			
2989	do	Inside	59,000	105,560	13.8	44.6	Silky; trace of granulation			
2974	Hoop B₁	Middle	62,000	117,720	13.0	33.5	Granular; silky center	7.8470	26.85	
2975	do	Outside	64,000	111,440	14.7	44.6	Silky; trace of granulation			
2976	do	Middle	64,000	116,400	13.2	36.4	Granular, 60 per cent.; silky, 40 per cent			
2977	do	Inside	65,000	114,400	13.3	41.9	do			
2978	Hoop B₂	Middle	56,000	107,040	15.2	36.4	Silky; trace of granulation	7.8497	21.40	
2979	do	Outside	63,000	115,880	13.7	36.4	Silky and fine granulation			

TABULATION OF TENSION SPECIMENS FROM 12″ B. L. RIFLED MORTAR—Continued.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per ct.*	*Per cent.*				
2980	Hoop B_3	Middle	58,000	109,440	13.5	36.4	Silky; slightly granular			
2981	do	Inside	61,000	112,480	13.7	41.9	Silky; trace of granulation			
2909	Hoop B_4	Middle	52,000	104,120	14.7	39.2	Granular, 50 per cent.; silky, 50 per cent			
2910	do	Outside	61,000	112,760	13.7	33.5	Granular, 60 per cent.; silky, 40 per cent			
2911	do	Middle	40,000	103,280	14.8	36.4	Silky, 60 per cent.; granular, 40 per cent	7.8539	21.89	
2912	do	Inside	55,000	103,920	14.7	41.9	Granular, 60 per cent.; silky, 40 per cent			
3000	do	Middle	56,000	110,720	13.3	33.5	Granular; silky center			Additional specimen.
2929	do	Outside	63,000	116,320	11.8	33.5	do			Do.
2930	do	Middle	57,000	109,440	13.5	36.4	do			Do.
2931	do	Inside	57,000	108,440	11.5	36.4	do			Do.
2905	Hoop B_5	Middle	50,000	102,760	14.8	39.2	Silky, 60 per cent.; granular, 40 per cent			
2906	do	Outside	59,000	108,520	15.5	44.6	Silky; slightly granular			
2907	do	Middle	53,000	102,160	14.7	44.6	Silky	7.8543	21.52	
2908	do	Inside	55,000	102,080	16.3	47.2	do			
3006	do	Middle	53,000	107,600	14.0	39.2	Silky, 60 per cent.; granular, 40 per cent			Do.
3007	do	Outside	61,000	114,120	14.5	36.4	Granular; silky center			Do.
3008	do	Middle	57,000	107,920	14.7	39.2	Silky; slightly granular			Do.
3009	do	Inside	55,000	102,120	16.5	44.6	Silky			Do.
2870	Hoop B_6	Middle	58,000	106,600	14.0	41.9	Silky; partly granular	7.8581	22.90	
2871	do	Outside	61,000	111,360	13.2	33.5	Granular; silky center			
2872	do	Middle	59,000	107,120	11.8	30.2	Granular, 60 per cent.; silky, 40 per cent			
2873	do	Inside	65,000	108,960	15.0	47.2	Silky			
3064	Breech block	do	45,000	93,520	17.3	39.2	Silky; slightly granular			
3065	do	Outside	52,000	103,240	10.0	18.3	Granular; dull spot			
3066	do	Middle	47,000	94,800	12.3	18.8	do	7.8564	17.62	
3228	do	Inside	54,000	93,200	11.8	18.3	do			New forging.
3229	do	Outside	58,000	100,400	19.7	44.6	Silky and fine granulation	7.8539	21.40	Do.
3230	do	Middle	52,000	95,600	16.7	44.6	do			Do.
2840	Gas-check ring	Inside	47,000	95,280	20.3	44.6	Silky			
2841	do	Outside	52,000	100,240	19.3	36.4	Silky; trace of granulation			
2842	do	Middle	50,000	98,000	19.3	41.9	Silky	7.8588	19.28	
2899	do	Inside	62,000	110,520	16.7	39.2	Granular; silky center			Additional specimen.
2900	do	Outside	60,000	113,950	16.5	34.0	do			Do.
2960	Face plate		48,000	[illegible]	14.3	30.6	do	7.8569	20.08	
2961	do		50,000	106,040	13.3	30.6	do			

3202	Spindle	Inside	57,000	106,960	16.7	41.9	Silky and fine granulation	7.8500	21.76
3203	do	Outside	57,000	102,680	16.7	47.2	Silky		
3204	do	Middle	57,000	107,160	16.7	39.2	Silky and fine granulation		
2942	Hinge pin		66,000	116,800	13.7	36.4	Granular; dull center	7.8529	28.68

The elongations of specimens from hoops were measured in 6 inches; all other specimens in 3 inches, excepting No. 2900 from gas-check ring, which was measured in 2 inches.

TABULATION OF COMPRESSION SPECIMENS FROM 12″ B. L. RIFLED MORTAR.

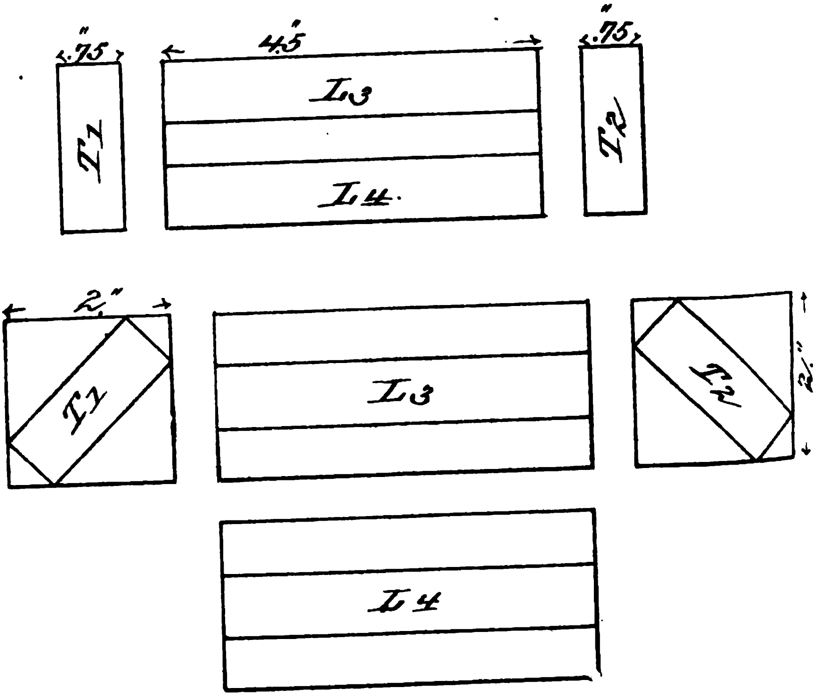
No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Pounds.	*Pounds.*		
710	Cast-iron body	Outside		54,880	Triple flexure	Breech end.
711	do	Inside		55,650	do	Do.
712	do	do		54,980	do	Do.
713	do	Outside		55,000	do	Do.
714	do	Radial		59,060	do	Do.
715	do	do		58,860	do	Do.
718	do	Outside		54,300	do	Muzzle end.
719	do	Inside		53,960	do	Do.
716	do	Radial		57,300	do	Do.
717	do	do		56,800	do	Do.

STEEL WIRE BILLETS.

INGOTS NOS. 1, 2, 3, 4, 5, 6, 7, AND 8, LOT NO. 3.

Steel wire billets

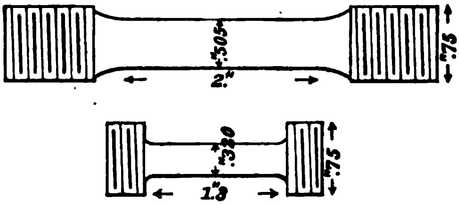
Location of specimens



WIRE BILLETS. LOT NO. 3.

DETAILS OF TESTS.

Forms of specimens.



INGOT No. 1.—*Lot No.* 3.

No. 3020.

Marks, $^{3\,W_1}_{U\,T_1}$
Diameter, ″.320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0002	.0002	0.	....	
800	10,000	.0004	.0002	0.	....	
1,200	15,000	.0005	.0001	0.	....	
1,600	20,000	.0007	.0002	0.	....	
2,000	25,000	.0009	.0002	0.	....	
2,400	30,000	.0011	.0002	....	....	Elastic limit.
2,480	31,000	.0046	.0035	....	....	
2,560	32,000	.0087	.0041	....	....	
2,640	33,000	.0100	.0013	....	....	
2,720	34,000	.0113	.0013	....	....	
2,800	35,000	.0128	.0015	....	....	
2,880	36,000	.0150	.0022	....	....	
2,960	37,000	.0165	.0015	....	....	
3,040	38,000	.0185	.0020	....	....	
3,120	39,000	.0200	.0015	....	....	
3,200	40,000	.0220	.0020	....	....	
3,360	42,000	.0280	.0060	....	....	
3,520	44,000	.0300	.0020	....	....	
3,680	46,000	.0330	.0030	....	....	
3,840	48,000	.0370	.0040	....	....	
4,000	50,000	.0431	.0061	....	....	
4,160	52,000	.0500	.0069	....	....	
4,320	54,000	.0575	.0075	....	....	
4,480	56,000	.0695	.0120	....	....	
4,640	58,000	.0800	.0105	....	....	
4,800	60,000	.095	.015	....	....	
4,960	62,000	.115	.020	....	....	
5,120	64,000	.17	.055	....	....	
5,160	64,500	.23	.06	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64,500
Elastic limit per square inch of original section	do....	30,000
Elongation per inch after rupture	inch..	0.25
Elongation per inch under strain at elastic limit	do....	.0011
Reduction in diameter at point of rupture	do....	.100
Reduction in area after rupture, per centum of original section		52.5
Position of rupture		at middle of stem
Character of broken surface		silky

No. 3021.

Marks, $\frac{3\,W_1}{U\,T_2}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1, 000	0.	0.	0.	0.	Initial load.
400	5, 000	.0001	.0001	0.	....	
800	10, 000	.0002	.0001	0.	....	
1, 200	15, 000	.0004	.0002	0.	....	
1, 600	20, 000	.0005	.0001	0.	....	
2, 000	25, 000	.0007	.0002	....	....	
2, 320	29, 000	.0009	.0002	....	....	Elastic limit.
2, 400	30, 000	.0020	.0011	....	....	
2, 480	31, 000	.0063	.0043	....	....	
2, 560	32, 000	.0075	.0012	....	....	
2, 640	33, 000	.0084	.0009	....	....	
2, 720	34, 000	.0100	.0016	....	....	
2, 800	35, 000	.0115	.0015	....	....	
2, 880	36, 000	.0128	.0013	....	....	
2, 960	37, 000	.0148	.0020	....	....	
3, 040	38, 000	.0158	.0010	....	....	
3, 120	39, 000	.0170	.0012	....	....	
3, 200	40, 000	.0187	.0017	....	....	
3, 360	42, 000	.0212	.0025	....	....	
3, 520	44, 000	.0262	.0050	....	....	
3, 680	46, 000	.0298	.0036	....	....	
3, 840	48, 000	.0340	.0042	....	....	
4, 000	50, 000	.0410	.0070	....	....	
4, 160	52, 000	.0480	,0070	....	....	
4, 320	54, 000	.0540	.0060	....	....	
4, 480	56, 000	.0640	.0100	....	....	
4, 640	58, 000	.0745	.0105	....	....	
4, 800	60, 000	.09	.0155	....	....	
4, 960	62, 000	.11	.02	....	....	
5, 120	64, 000	.14	.03	....	....	
5, 160	64, 500	.21	.07	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 64, 500
Elastic limit per square inch of original section..........do.... 29, 000
Elongation per inch after rupture..........inch.. 0.34
Elongation per inch under strain at elastic limit..........do.... .0006
Reduction in diameter at point of rupture..........do.... .0[illegible]
Reduction in area after rupture, per centum of original section.......... 47.5
Position of rupture..........at middle of stem
Character of broken surface..........silky

No. 3022.

Marks, $\overset{3\,W_1}{U\,L_1}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	Elastic limit.
6,200	31,000	.003100	.002150	....	....	
6,400	32,000	.008250	.005150	....	....	
6,600	33,000	.009650	.001400	....	....	
6,800	34,000	.010750	.001100	....	....	
7,000	35,000	.011900	.001150	....	....	
7,200	36,000	.013100	.001200	....	....	
7,400	37,000	.014750	.001650	....	....	
7,600	38,000	.016000	.001250	....	....	
7,800	39,000	.017000	.001000	....	....	
8,000	40,000	.018650	.001650	....	....	
8,400	42,000	.021900	.003250	....	....	
8,800	44,000	.025600	.003700	....	....	
9,200	46,000	.029400	.003800	....	....	
9,600	48,000	.033500	.004100	....	....	
10,000	50,000	.038250	.004750	....	....	
10,400	52,000	.044000	.005750	....	....	
10,800	54,000	.049900	.005900	....	....	
11,200	56,000	.058250	.008350	....	....	
11,600	58,000	.0650	.006750	....	....	
12,000	60,000	.0850	.0200	....	....	
12,400	62,000	.1000	.0150	....	....	
12,800	64,000	.1250	.0250	....	....	
13,200	66,000	.1850	.0600	....	....	
13,220	66,100	.2300	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	66,100
Elastic limit per square inch of original section ....do ...	30,000
Elongation per inch after rupture ....inch..	0.3650
Elongation per inch under strain at elastic limit ....do....	.000950
Reduction in diameter at point of rupture ....do....	.185
Reduction in area after rupture, per centum of original section	59.8
Position of rupture	1″.05 from neck
Character of broken surface	fine silky
Elongation of inch sections	″.48, ″.25

No. 3023.

Marks, $\frac{3\ W_1}{U\ L_4}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000350	.000200	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000900	.000200	.000050	.000050	
6,000	30,000	.001100	.000200	.000050	0.	Elastic limit.
6,200	31,000	.001250	.000150	....	....	
6,400	32,000	.005750	.004500	....	....	
6,600	33,000	.009000	.003250	....	....	
6,800	34,000	.010250	.001250	....	....	
7,000	35,000	.011500	.001250	....	....	
7,200	36,000	.012500	.001000	....	....	
7,400	37,000	.013700	.001200	....	....	
7,600	38,000	.014600	.000900	....	....	
7,800	39,000	.016100	.001500	....	....	
8,000	40,000	.017600	.001500	....	....	
8,400	42,000	.020500	.002900	....	....	
8,800	44,000	.024050	.003550	....	....	
9,200	46,000	.027500	.003450	....	....	
9,600	48,000	.031600	.004100	....	....	
10,000	50,000	.036250	.004650	....	....	
10,400	52,000	.041300	.005050	....	....	
10,800	54,000	.047250	.005950	....	....	
11,200	56,000	.054250	.007000	....	....	
11,600	58,000	.062250	.008000	....	....	
12,000	60,000	.0700	.007750	....	....	
12,400	62,000	.0900	.0200	....	....	
12,800	64,000	.1050	.0150	....	....	
13,200	66,000	.1450	.0400	....	....	
13,370	66,850	.2100	.0650	....	....	Tensile strength.
10,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................pounds.. 66,850
Elastic limit per square inch of original section....................do.... 30,000
Elongation per inch after rupture....................inch.. 0.3650
Elongation per inch under strain at elastic limit....................do.... .001100
Reduction in diameter at point of rupture....................do.... .185
Reduction in area after rupture, per centum of original section.................... 50.8
Position of rupture.................... 1″.25 from neck
Character of broken surface....................fine, silky
Elongation of inch sections....................″.47″, ″.35

No. 3024.

Marks, $^{3\,W_1}_{B\,T_6}$
Diameter, ″.320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1, 000	0.	0.	0.	0.	Initial load.
400	5, 000	.0002	.0002	0.	....	
800	10, 000	.0003	.0001	0.	....	
1, 200	15, 000	.0004	.0001	0.	....	
1, 600	20, 000	.0006	.0002	0.	....	
2, 000	25, 000	.0008	.0002	0.	....	
2, 400	30, 000	.0010	.0002	0.	....	
2, 480	31, 000	.0010	0.	....	....	
2, 560	32, 000	.0011	.0001	....	....	
2, 640	33, 000	.0012	.0001	....	....	Elastic limit.
2, 720	34, 000	.0130	.0118	....	....	
2, 800	35, 000	.0150	.0020	....	....	
2, 880	36, 000	.0160	.0010	....	....	
2, 960	37, 000	.0180	.0020	....	....	
3, 040	38, 000	.0195	.0015	....	....	
3, 120	39, 000	.0208	.0013	....	....	
3, 200	40, 000	.0230	.0022	....	....	
3, 360	42, 000	.0260	.0030	....	....	
3, 520	44, 000	.0285	.0025	....	....	
3, 680	46, 000	.0345	.0060	....	....	
3, 840	48, 000	.0394	.0049	....	....	
4, 000	50, 000	.0465	.0071	....	....	
4, 160	52, 000	.0540	.0075	....	....	
4, 320	54, 000	.0610	.0070	....	....	
4, 480	56, 000	.07	.0090	....	....	
4, 640	58, 000	.085	.0015	....	....	
4, 800	60, 000	.10	.0015	....	....	
4, 960	62, 000	.12	.02	....	....	
5, 120	64, 000	.19	.07	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64, 000
Elastic limit per square inch of original section	do....	33, 000
Elongation per inch after rupture	inch..	0. 27
Elongation per inch under strain at elastic limit	do....	.0012
Reduction in diameter at point of rupture	do....	.050
Reduction in area after rupture, per centum of original section		28. 4
Position of rupture		″.45 from neck
Character of broken surface		silky, serrated. Opened numerous cracks in surface of stem

No. 3025.

Marks, $\frac{3\ W_1}{B\ T_6}$

Diameter, ″.319.

Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0005	.0001	0.	....	
2,000	25,000	.0007	.0002	0.	....	
2,400	30,000	.0009	.0002	....	....	
2,480	31,000	.0010	.0001	....	....	Elastic limit.
2,560	32,000	.0014	.0004	....	....	
2,640	33,000	.0120	.0106	....	....	
2,720	34,000	.0132	.0012	....	....	
2,800	35,000	.0142	.0010	....	....	
2,880	36,000	.0158	.0016	....	....	
2,960	37,000	.0170	.0012	....	....	
3,040	38,000	.0182	.0012	....	....	
3,120	39,000	.0196	.0014	....	....	
3,200	40,000	.0220	.0024	....	....	
3,360	42,000	.0258	.0038	....	....	
3,520	44,000	.0295	.0037	....	....	
3,680	46,000	.0335	.0040	....	....	
3,840	48,000	.0375	.0040	....	....	
4,000	50,000	.0440	.0065	....	....	
4,160	52,000	.0523	.0083	....	....	
4,320	54,000	.0590	.0067	....	....	
4,480	56,000	.0665	.0075	....	....	
4,640	58,000	.0780	.0115	....	....	
4,800	60,000	.10	.0220	....	....	
4,960	62,000	.12	.02	....	....	
5,120	64,000	.16	.04	....	....	
5,190	64,890	.23	.07	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64,890
Elastic limit per square inch of original section	do....	31,000
Elongation per inch after rupture	inch....	0.23
Elongation per inch under strain at elastic limit	do....	.0010
Reduction in diameter at point of rupture	do....	.069
Reduction in area after rupture, per centum of original section		38.6
Position of rupture		at middle of stem
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3026.

Marks, $\frac{3\,W,}{B\,L,}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000350	.000200	0.		
3,000	15,000	.000550	.000200	0.		
4,000	20,000	.000700	.000150	0.		
5,000	25,000	.000850	.000150	0.		
6,000	30,000	.001000	.000150			
6,200	31,000	.001050	.000050			
6,400	32,000	.001050	0.			
6,600	33,000	.001100	.000050			Elastic limit.
6,800	34,000	.001300	.000200			
7,000	35,000	.013650	.012350			
7,200	36,000	.014900	.001250			
7,400	37,000	.016000	.001100			
7,600	38,000	.017400	.001400			
7,800	39,000	.019000	.001600			
8,000	40,000	.020500	.001500			
8,400	42,000	.024150	.003550			
8,800	44,000	.027600	.003550			
9,200	46,000	.031750	.004150			
9,600	48,000	.036500	.004750			
10,000	50,000	.042250	.005750			
10,400	52,000	.048400	.006150			
10,800	54,000	.055500	.007100			
11,200	56,000	.064500	.009000			
11,600	58,000	.0750	.0105			
12,000	60,000	.0950	.0200			
12,400	62,000	.1150	.0200			
12,800	64,000	.1600	.0450			
12,890	64,450	.2150	.0550			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64,450
Elastic limit per square inch of original section	do....	33,000
Elongation per inch after rupture	inch..	0.3850
Elongation per inch under strain at elastic limit	do....	.001100
Reduction in diameter at point of rupture	do....	.195
Reduction in area after rupture, per centum of original section		62.2
Position of rupture		1″.30 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.34, ″.43*

No. 3027.

Marks, $\overset{3}{}W_{1}$ B L_{6}
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000450	.000150	0.		
4,000	20,000	.000600	.000150	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000950	.000200			
6,200	31,000	.000950	0.			
6,400	32,000	.001000	.000050			
6,600	33,000	.001050	.000050			Elastic limit.
6,800	34,000	.012000	.010950			
7,000	35,000	.012900	.000900			
7,200	36,000	.013900	.001000			
7,400	37,000	.015250	.001350			
7,600	38,000	.016400	.001150			
7,800	39,000	.017900	.001500			
8,000	40,000	.019250	.001850			
8,400	42,000	.022500	.003250			
8,800	44,000	.026000	.003500			
9,200	46,000	.029900	.003900			
9,600	48,000	.034000	.004100			
10,000	50,000	.039100	.005100			
10,400	52,000	.045000	.005900			
10,800	54,000	.052000	.007000			
11,200	56,000	.059000	.0070 0			
11,600	58,000	.068000	.009000			
12,000	60,000	.0850	.0170			
12,400	62,000	.0950	.0100			
12,800	64,000	.1150	.0200			
13,190	65,950	.2100	.0950			Tensile strength.

General summary.

Tensile strength per square inch of original section.................................pounds.. 65,950
Elastic limit per square inch of original section ....do ... 33,000
Elongation per inch after rupture. ....inch.. 0.364
Elongation per inch under strain at elastic limit ....do .... .001050
Reduction in diameter at point of rupture ....do .... .195
Reduction in area after rupture, per centum of original section.................................. 62.3
Position of rupture ....1".20 from neck
Character of broken surface...fine silky
Elongation of inch sections...".44, ".28

INGOT NO. 2.—*Lot No. 3.*

No. 2901.

Marks, $\frac{3\,W_2}{U\,T_1}$,
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0003	.0002	0.	....	
1,200	15,000	.0005	.0002	0.	....	
1,600	20,000	.0006	.0001	0.	....	
2,000	25.000	.0007	.0001	0.	....	
2,400	30,000	.0008	.0001	0.	....	
2,560	32,000	.0008	0.	....	....	
2,720	34,000	.0009	.0001	....	....	
2,880	36,000	.0010	.0001	....	....	
2,960	37.000	.0011	.0001	....	....	Elastic limit.
3,040	38,000	.0020	.0009	....	....	
3,120	39,000	.0126	.0006	....	....	
3,200	40.000	.0200	.0074	....	....	
3,280	41,000	.0210	.0010	....	....	
3,360	42.000	.0220	.0010	....	....	
3,440	43,000	.0231	.0011	....	....	
3,520	44,000	.0250	.0019	....	....	
3,600	45,000	.0265	.0015	....	....	
3,680	46,000	.0282	.0017	....	....	
3,760	47,000	.0295	.0018	....	....	
3,840	48,000	.0308	.0013	....	....	
3,920	49,000	.0332	.0024	....	....	
4,000	50,000	.0358	.0026	....	....	
4,160	52,000	.0403	.0045	....	....	
4,320	54,000	.0470	.0067	....	....	
4,480	56,000	.0552	.0082	....	....	
4,640	58,000	.0610	.0058	....	....	
4,800	60,000	.07	.0090	....	....	
4,960	62,000	.08	.01	....	....	
5,120	64,000	.095	.015	....	....	
5,280	66,000	.12	.025	....	....	
5,440	68,000	.17	.05	....	....	
5,460	68,250	.21	.04	....	....	Tensile strength.

General summary.

Tensile strength, per square inch of original section	pounds	68,250
Elastic limit per square inch of original section	do	37,000
Elongation per inch after rupture	inch	0.28
Elongation per inch under strain at elastic limit	do	.0011
Reduction in diameter at point of rupture	do	.039
Reduction in area after rupture, per centum of original section		23
Position of rupture		″.60 from neck
Character of broken surface		granular, 50 per cent.; flaky, 50 per cent

No. 2902.

Marks, $\frac{8\ W_3}{U\ T_3}$

Diameter, ″.319.

Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0002	.0002	0.	....	
800	10,000	.0004	.0002	0.	....	
1,200	15,000	.0005	.0001	0.	....	
1,600	20,000	.0006	.0001	0.	....	
2,000	25,000	.0008	.0002	0.	....	
2,400	30,000	.0010	.0002	.0001	.0001	
2,560	32,000	.0011	.0001	....	....	
2,720	34,000	.0011	0.	....	....	
2,800	35,000	.0011	0.	....	....	
2,880	36,000	.0012	.0001	....	....	
2,960	37,000	.0012	0.	....	....	
3,040	38,000	.0018	.0001	....	....	
3,120	39,000	.0013	0.	....	....	Elastic limit.
3,200	40,000	.0125	.0112	....	....	
3,280	41,000	.0207	.0082	....	....	
3,360	42,000	.0212	.0005	....	....	
3,440	43,000	.0217	.0005	....	....	
3,520	44,000	.0232	.0016	....	....	
3,600	45,000	.0256	.0024	....	....	
3,680	46,000	.0273	.0017	....	....	
3,760	47,000	.0285	.0012	....	....	
3,840	48,000	.0300	.0015	....	....	
3,920	49,000	.0327	.0027	....	....	
4,000	50,000	.0358	.0026	....	....	
4,160	52,000	.0387	.0034	....	....	
4,320	54,000	.0467	.0080	....	....	
4,480	56,000	.0554	.0087	....	....	
4,640	58,000	.07	.0146	....	....	
4,800	60,000	.075	.005	....	....	
4,960	62,000	.085	.010	....	....	
5,120	64,000	.10	.015	....	....	
5,280	66,000	.12	.020	....	....	
5,440	68,000	.17	.05	....	....	
5,460	68,250	.22	.05	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	68,250
Elastic limit per square inch of original section	do ...	39,000
Elongation per inch after rupture	inch..	0.22
Elongation per inch under strain at elastic limit	do....	.0013
Reduction in diameter at point of rupture	do....	.079
Reduction in area after rupture, per centum of original section	......	43.5
Position of rupture		″.42 from neck
Character of broken surface		flaky, serrated

No. 2903.

Marks, $\overset{{}^{3}W_{2}}{UL_{3}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000150	.000150	0.	....	
2, 000	10, 000	.000300	.000150	0.	....	
3, 000	15, 000	.000450	.000150	0.	....	
4, 000	20, 000	.000600	.000150	0.	....	
5, 000	25, 000	.000800	.000200	0.	....	
6, 000	30, 000	.000950	.000150	0.	....	
7, 000	35, 000	.001150	.000200	....	....	
7, 200	36, 000	.001150	0.	....	....	
7, 400	37, 000	.001200	.000050	....	....	
7, 600	38, 000	.001250	.000050	....	....	
7, 800	39, 000	.001300	.000050	....	....	
8, 000	40, 000	.001300 .003300	0. .002000	....	....	Elastic limit.
8, 200	41, 000	.017000	.013700	....	....	
8, 400	42, 000	.018750	.001750	....	....	
8, 600	43, 000	.021900	.003150	....	....	
8, 800	44, 000	.023250	.001350	....	....	
9, 000	45, 000	.024000	.000750	....	....	
9, 200	46, 000	.024900	.000900	....	....	
9, 400	47, 000	.026250	.001350	....	....	
9, 600	48, 000	.028350	.002100	....	....	
9, 800	49, 000	.030000	.001650	....	....	
10, 000	50, 000	.032550	.002550	....	....	
10, 400	52, 000	.037000	.004450	....	....	
10, 800	54, 000	.042000	.005000	....	....	
11, 200	56, 000	.047200	.005200	....	....	
11, 600	58, 000	.054000	.006800	....	....	
12, 000	60, 000	.063250	.009250	....	....	
12, 400	62, 000	.0700	.006750	....	....	
12, 800	64, 000	.0850	.0150	....	....	
13, 200	66, 000	.1050	.0200	....	....	
13, 600	68, 000	.1250	.0200	....	....	
13, 840	69, 200	.2100	.0850	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	69, 200
Elastic limit per square inch of original section	do ...	40, 000
Elongation per inch after rupture	inch..	0. 3600
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	. 196
Reduction in area after rupture, per centum of original section		62. 2
Position of rupture		1″.15 from neck
Character of broken surface		silky
Elongation of inch sections		″.27, ″.45*

No. 2904.

Marks, $\begin{smallmatrix}{}^{3}W_{2}\\ U\,L_{4}\end{smallmatrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000700	.000250	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001050	.000200	.000050	.000050	
6,200	31,000	.001100	.000050	....	....	
6,400	32,000	.001150	.000050	....	....	
6,600	33,000	.001200	.000050	....	....	
6,800	34,000	.001250	.000050	....	....	
7,000	35,000	.001300	.000050	....	....	
7,200	36,000	.001350	.000050	....	....	
7,400	37,000	.001400	.000050	....	....	
7,600	38,000	.001450	.000050	....	....	
7,800	39,000	.001500	.000050	....	....	
8,000	40,000	.001550	.000050	....	....	
8,200	41,000	.001600	.000050	....	....	Elastic limit.
8,400	42,000	.020500	.018900	....	....	
8,600	43,000	.021600	.001100	....	....	
8,800	44,000	.022850	.001250	....	....	
9,000	45,000	.024000	.001150	....	....	
9,200	46,000	.026000	.002000	....	....	
9,400	47,000	.027250	.001250	....	....	
9,600	48,000	.029300	.002050	....	....	
9 800	49,000	.031000	.001700	....	....	
10,000	50,000	.033500	.002500	....	....	
10,400	52,000	.037200	.003700	....	....	
10,800	54,000	.042800	.005600	....	....	
11,200	56,000	.049250	.006450	....	....	
11,600	58,000	.057000	.007750	....	....	
12,000	60,000	.065000	.008000	....	....	
12,400	62,000	.0800	.0150	....	....	
12,800	64,000	.0900	.0100	....	....	
13,200	66,000	.1100	.0200	....	....	
13,600	68,000	.1550	.0450	....	....	
13,720	68,600	.2000	.0450	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	68,600
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.3000
Elongation per inch under strain at elastic limit	do ...	.001600
Reduction in diameter at point of rupture	do....	.195
Reduction in area after rupture, per centum of original section		62.3
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		″.35, ″.37

No. 3028.

Marks, $^{3\,W,}_{B\,T}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0007	.0001	0.	....	
2,400	30,000	.0009	.0002	....	....	
2,480	31,000	.0009	0.	....	....	
2,560	32,000	.0010	.0001	....	....	
2,640	33,000	.0010	0.	....	....	Elastic limit.
2,720	34,000	.0032	.0022	....	....	
2,800	35,000	.0140	.0108	....	....	
2,880	36,000	.0165	.0025	....	....	
2,960	37,000	.0184	.0019	....	....	
3,040	38,000	.0198	.0014	....	....	
3,120	39,000	.0210	.0012	....	....	
3,200	40,000	.0230	.0020	....	....	
3,360	42,000	.0250	.0020	....	....	
3,520	44,000	.0291	.0041	....	....	
3,680	46,000	.0322	.0031	....	....	
3,840	48,000	.0375	.0053	....	....	
4,000	50,000	.0440	.0065	....	....	
4,160	52,000	.0506	.0066	....	....	
4,320	54,000	.0560	.0054	....	....	
4,480	56,000	.0650	.0090	....	....	
4,640	58,000	.0755	.0105	....	....	
4,800	60,000	.09	.0145	....	....	
4,960	62,000	.11	.02	....	....	
5,120	64,000	.14	.03	....	....	
5,220	65,250	.23	.09	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,250
Elastic limit per square inch of original section	do	33,000
Elongation per inch after rupture	inch	0.31
Elongation per inch under strain at elastic limit	do	.0010
Reduction in diameter at point of rupture	do	.069
Reduction in area after rupture, per centum of original section		38.6
Position of rupture		″.35 rom neck
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3029.

Marks, $^{3\,W_2}_{B\,T_3}$
Diameter, ".319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0003	.0001	0.	....	
1,600	20,000	.0005	.0002	0.	....	
2,000	25,000	.0008	.0003	0.	....	
2,400	30,000	.0010	.0002	....	....	
2,480	31,000	.0010	0.	....	....	
2,560	32,000	.0011	.0001	....	....	
2,640	33,000	.0011	0.	....	....	
2,720	34,000	.0012	.0001	....	....	Elastic limit.
2,800	35,000	.0152	.0140	....	....	
2,880	36,000	.0161	.0009	....	....	
2,960	37,000	.0170	.0009	....	....	
3,040	38,000	.0179	.0009	....	....	
3,120	39,000	.0195	.0016	....	....	
3,200	40,000	.0212	.0017	....	....	
3,360	42,000	.0258	.0046	....	....	
3,520	44,000	.0290	.0032	....	....	
3,680	46,000	.0325	.0035	....	....	
3,840	48,000	.0375	.0050	....	....	
4,000	50,000	.0440	.0065	....	....	
4,160	52,000	.0490	.0050	....	....	
4,320	54,000	.0570	.0080	....	....	
4,480	56,000	.0671	.0100	....	....	
4,640	58,000	.08	.0129	....	....	
4,800	60,000	.10	.02	....	....	
4,960	62,000	.12	.02	....	....	
5,120	64,000	.16	.04	....	....	
5,210	65,125	.24	.08	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 65,125
Elastic limit per square inch of original section ....do ... 34,000
Elongation per inch after rupture...inch.. 0.24
Elongation per inch under strain at elastic limit.......................................do.... .0012
Reduction in diameter at point of rupture..do ... .059
Reduction in area after rupture, per centum of original section 33.6
Position of rupture ....".40 from neck
Character of broken surface...................................silky, serrated. Opened cracks in stem

No. 3030.

Marks, $^{8\ W_2}_{B\ L_4}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.001000	.000200	....	....	
6,200	31,000	.001000	0.	....	....	
6,400	32,000	.001050	.000050	....	....	
6,600	33,000	.001100	.000050	....	....	
6,800	34,000	.001150	.000050	....	....	
7,000	35,000	.001200	.000050	....	....	Elastic limit.
7,200	36,000	.015250	.014050	....	....	
7,400	37,000	.016100	.000850	....	....	
7,600	38,000	.017500	.001400	....	....	
7,800	39,000	.019000	.001500	....	....	
8,000	40,000	.020250	.001250	....	....	
8,400	42,000	.023500	.003250	....	....	
8,800	44,000	.027250	.003750	....	....	
9,200	46,000	.032000	.004750	....	....	
9,600	48,000	.036000	.004000	....	....	
10,000	50,000	.041750	.005750	....	....	
10,400	52,000	.047500	.005750	....	....	
10,800	54,000	.054000	.006500	....	....	
11,200	56,000	.063750	.009750	....	....	
11,600	58,000	.074000	.010250	....	....	
12,000	60,000	.0850	.0110	....	....	
12,400	62,000	.1050	.0200	....	....	
12,800	64,000	.1450	.0400	....	....	
13,000	65,000	.2100	.0650	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	65,000
Elastic limit per square inch of original section	do....	35,000
Elongation per inch after rupture	inch..	0.3700
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.195
Reduction in area after rupture, per centum of original section		62.2
Position of rupture		at middle of stem
Character of broken surface		fine silky
Elongation of inch sections		″.35*, ″.39*

No. 3031.

Marks, $^{3}_{B}{}^{W_2}_{L_4}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000700	.000250	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	....	....	
6,200	31,000	.001000	0.	....	....	
6,400	32,000	.001050	.000050	....	....	
6,600	33,000	.001150	.000100	....	....	
6,800	34,000	.001200	.000050	....	....	Elastic limit.
7,000	35,000	.001550	.000350	....	....	
7,200	36,000	.007500	.005950	....	....	
7,400	37,000	.015650	.008150	....	....	
7,600	38,000	.017500	.001850	....	....	
7,800	39,000	.019000	.001500	....	....	
8,000	40,000	.020250	.001250	....	....	
8,400	42,000	.022600	.002350	....	....	
8,800	44,000	.026500	.003900	....	....	
9,200	46,000	.030000	.003500	....	....	
9,600	48,000	.034500	.004500	....	....	
10,000	50,000	.039250	.004750	....	....	
10,400	52,000	.045000	.005750	....	....	
10,800	54,000	.051300	.006300	....	....	
11,200	56,000	.058750	.007450	....	....	
11,600	58,000	.068000	.009250	....	....	
12,000	60,000	.0800	.0120	....	....	
12,400	62,000	.0950	.0150	....	....	
12,800	64,000	.1200	.0250	....	....	
13,200	66,000	.1800	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds.. 66,000
Elastic limit per square inch of original section..........do.... 34,000
Elongation per inch after rupture..........inch.. 0.[illegible]
Elongation per inch under strain at elastic limit..........do.... .[illegible]
Reduction in diameter at point of rupture..........do.... .105
Reduction in area after rupture, per centum of original section.......... [illegible]
Position of rupture.......... at middle of [illegible]
Character of broken surface.......... [illegible]
Elongation of inch sections.......... [illegible]

INGOT NO. 3.—*Lot No.* 3.

No. 2932.

Marks, $^{3\,W_3}_{U\,T_1}$
Diameter, ″.320.
Sectional area, .0804 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
402	5,000	.0002	.0002	0.	....	
804	10,000	.0004	.0002	0.	....	
1,206	15,000	.0006	.0002	0.	....	
1,608	20,000	.0008	.0002	0.	....	
2,010	25,000	.0010	.0002	0.	....	
2,412	30,000	.0012	.0002	....	....	
2,492	31,000	.0012	0.	....	....	
2,572	32,000	.0012	0.	....	....	
2,653	33,000	.0013	.0001	....	....	
2,733	34,000	.0013	0.	....	....	
2,814	35,000	.0014	.0001	....	....	Elastic limit.
2,894	36,000	.0150	.0136	....	....	
2,975	37,000	.0174	.0024	....	....	
3,055	38,000	.0185	.0011	....	....	
3,136	39,000	.0195	.0010	....	....	
3,216	40,000	.0210	.0015	....	....	
3,296	41,000	.0230	.0020	....	....	
3,377	42,000	.0245	.0015	....	....	
3,457	43,000	.0265	.0020	....	....	
3,538	44,000	.0290	.0025	....	....	
3,618	45,000	.0320	.0030	....	....	
3,698	46,000	.0348	.0028	....	....	
3,779	47,000	.0367	.0019	....	....	
3,859	48,000	.0387	.0020	....	....	
3,940	49,000	.0425	.0038	....	....	
4,020	50,000	.0465	.0040	....	....	
4,181	52,000	.0560	.0095	....	....	
4,342	54,000	.0630	.0070	....	....	
4,502	56,000	.0790	.0160	....	....	
4,663	58,000	.085	.0060	....	....	
4,824	60,000	.11	.025	....	....	
4,910	61,070	.15	.04	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	61,070
Elastic limit per square inch of original section	do	35,000
Elongation per inch after rupture	inch	0.17
Elongation per inch under strain at elastic limit	do	.0014
Reduction in diameter at point of rupture	do	.045
Reduction in area after rupture, per centum of original section		26.1
Position of rupture		″.35 from neck
Character of broken surface		dull silky, serrated. Opened numerous cracks in surface of stem

No. 2933.

Marks, $\overset{3\,W_{3}}{U\,T_{2}}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0002	.0002	0.	....	
800	10,000	.0004	.0002	0.	....	
1,200	15,000	.0006	.0002	0.	....	
1,600	20,000	.0008	.0002	0.	....	
2,000	25,000	.0010	.0002	0.	....	
2,400	30,000	.0012	.0002	0.	....	
2,480	31,000	.0013	.0001	....	....	Elastic limit.
2,560	32,000	.0027	.0014	....	....	
2,640	33,000	.0092	.0065	....	....	
2,720	34,000	.0104	.0012	....	....	
2,800	35,000	.0122	.0018	....	....	
2,880	36,000	.0137	.0015	....	....	
2,960	37,000	.0160	.0023	....	....	
3,040	38,000	.0172	.0012	....	....	
3,120	39,000	.0189	.0017	....	....	
3,200	40,000	.0210	.0021	....	....	
3,280	41,000	.0230	.0020	....	....	
3,360	42,000	.0251	.0021	....	....	
3,440	43,000	.0270	.0019	....	....	
3,520	44,000	.0290	.0020	....	....	
3,600	45,000	.0317	.0027	....	....	
3,680	46,000	.0341	.0024	....	....	
3,760	47,000	.0370	.0029	....	....	
3,840	48,000	.0392	.0022	....	....	
3,920	49,000	.0420	.0028	....	....	
4,000	50,000	.0470	.0050	....	....	
4,160	52,000	.0520	.0050	....	....	
4,320	54,000	.0640	.0120	....	....	
4,480	56,000	.07	.0060	....	....	
4,640	58,000	.09	.02	....	....	
4,800	60,000	.11	.02	....	....	
4,960	62,000	.15	.04	....	....	
5,080	63,500	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	**pounds**	**63,500**
Elastic limit per square inch of original section	**do**	**31,000**
Elongation per inch after rupture	**inch**	**0.37**
Elongation per inch under strain at elastic limit	**do**	**.0013**
Reduction in diameter at point of rupture	**do**	**.094**
Reduction in area after rupture, per centum of original section		**50.2**
Position of rupture		**″.5 from neck**
Character of broken surface		**silky, serrated. Opened cracks in surface of stem**

No. 2934.

Marks, $\begin{matrix}3\ W\ 3\\ U\ L\ 8\end{matrix}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.000950	.000150	0.	....	
7,000	35,000	.001100	.000150	....	....	
7,200	36,000	.001150	.000050	....	....	Elastic limit.
7,400	37,000	.009850	.008700	....	....	
7,600	38,000	.014000	.004150	....	....	
7,800	39,000	.015000	.001000	....	....	
8,000	40,000	.016100	.001100	....	....	
8,200	41,000	.017900	.001800	....	....	
8,400	42,000	.019550	.001650	....	....	
8,600	43,000	.021000	.001450	....	....	
8,800	44,000	.022650	.001650	....	....	
9,000	45,000	.024800	.002150	....	....	
9,200	46,000	.027000	.002200	....	....	
9,400	47,000	.029050	.002050	....	....	
9,600	48,000	.032500	.003450	....	....	
9,800	49,000	.035000	.002500	....	....	
10,000	50,000	.036750	.001750	....	....	
10,400	52,000	.041000	.004250	....	....	
10,800	54,000	.047750	.006750	....	....	
11,200	56,000	.056000	.008250	....	....	
11,600	58,000	.063750	.007750	....	....	
12,000	60,000	.077000	.013250	....	....	
12,400	62,000	.0950	.0180	....	....	
12,800	64,000	.1150	.0200	....	....	
13,170	65,850	.1950	.0800	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,850
Elastic limit per square inch of original section	do	36,000
Elongation per inch after rupture	inch	0.3650
Elongation per inch under strain at elastic limit	do	.001150
Reduction in diameter at point of rupture	do	.215
Reduction in area after rupture, per centum of original section		66.9
Position of rupture		1″.05 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.23, ″.56

No. 3027.

Marks, $^{3\,W\,1}_{B\,L\,4}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000450	.000150	0.		
4,000	20,000	.000600	.000150	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000950	.000200			
6,200	31,000	.000950	0.			
6,400	32,000	.001000	.000050			
6,600	33,000	.001050	.000050			Elastic limit.
6,800	34,000	.012000	.010950			
7,000	35,000	.012900	.000900			
7,200	36,000	.013900	.001000			
7,400	37,000	.015250	.001350			
7,600	38,000	.016400	.001150			
7,800	39,000	.017900	.001500			
8,000	40,000	.019250	.001350			
8,400	42,000	.022500	.003250			
8,800	44,000	.026000	.003500			
9,200	46,000	.029900	.003900			
9,600	48,000	.034000	.004100			
10,000	50,000	.039100	.005100			
10,400	52,000	.045000	.005900			
10,800	54,000	.052000	.007000			
11,200	56,000	.059000	.0070 0			
11,600	58,000	.068000	.009000			
12,000	60,000	.0850	.0170			
12,400	62,000	.0950	.0100			
12,800	64,000	.1150	.0200			
13,190	65,950	.2100	.0950			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,950
Elastic limit per square inch of original section	do	33,000
Elongation per inch after rupture	inch	0.3640
Elongation per inch under strain at elastic limit	do	.001050
Reduction in diameter at point of rupture	do	.195
Reduction in area after rupture, per centum of original section		62.2
Position of rupture		1".20 from neck
Character of broken surface		fine silky
Elongation of inch sections		".44*, ".28

No. 3032.

Marks, $^{\text{S W.}}_{\text{B T.}}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0003	.0001	0.	....	
1,600	20,000	.0005	.0002	0.	....	
2,000	25,000	.0006	.0001	0.	....	
2,400	30,000	.0008	.0002	....	....	
2,480	31,000	.0009	.0001	....	....	
2,560	32,000	.0010	.0001	....	....	
2,640	33,000	.0010	0.	....	....	
2,720	34,000	.0011	.0001	....	....	
2,800	35,000	.0011	0.	....	....	Elastic limit.
2,880	36,000	.0078	.0067	....	....	
2,960	37,000	.0150	.0072	....	....	
3,040	38,000	.0191	.0041	....	....	
3,120	39,000	.0210	.0019	....	....	
3,200	40,000	.0226	.0016	....	....	
3,360	42,000	.0260	.0034	....	....	
3,520	44,000	.0302	.0042	....	....	
3,680	46,000	.0358	.0056	....	....	
3,840	48,000	.0395	.0037	....	....	
4,000	50,000	.0455	.0060	....	....	
4,160	52,000	.0535	.0080	....	....	
4,320	54,000	.0596	.0061	....	....	
4,480	56,000	.0700	.0104	....	....	
4,640	58,000	.0810	.0110	....	....	
4,800	60,000	.10	.0190	....	....	
4,960	62,000	.12	.02	....	....	
5,120	64,000	.17	.05	....	....	
5,160	64,500	.24	.07	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	64,500
Elastic limit per square inch of original section	do	35,000
Elongation per inch after rupture	inch	0.37
Elongation per inch under strain at elastic limit	do	.0011
Reduction in diameter at point of rupture	do	.079
Reduction in area after rupture, per centum of original section		48.7
Position of rupture		at middle of stem
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3033.

Marks, $^{3\,W_3}_{B\,T_3}$
Diameter, ".319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0007	.0001	0.	....	
2,400	30,000	.0009	.0002	....	....	
2,480	31,000	.0010	.0001	....	....	
2,560	32,000	.0010	0.	....	....	
2,640	33,000	.0011	.0001	....	....	
2,720	34,000	.0011	0.	....	....	
2,800	35,000	.0012	.0001	....	....	
2,880	36,000	.0013	.0001	....	....	Elastic limit.
2,960	37,000	.0160	.0147	....	....	
3,040	38,000	.0170	.0010	....	....	
3,120	39,000	.0179	.0009	....	....	
3,200	40,000	.0195	.0016	....	....	
3,360	42,000	.0235	.0040	....	....	
3,520	44,000	.0265	.0030	....	....	
3,680	46,000	.0307	.0042	....	....	
3,840	48,000	.0340	.0033	....	....	
4,000	50,000	.0391	.0051	....	....	
4,160	52,000	.0470	.0079	....	....	
4,320	54,000	.0570	.0100	....	....	
4,480	56,000	.0640	.0070	....	....	
4,640	58,000	.08	.0160	....	....	
4,800	60,000	.10	.02	....	....	
4,960	62,000	.12	.02	....	....	
5,120	64,000	.14	.02	....	....	
5,280	66,000	.17	.03	....	....	
5,320	66,500	.23	.06	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	66,500
Elastic limit per square inch of original section	do	36,000
Elongation per inch after rupture	inch	0.37
Elongation per inch under strain at elastic limit	do	.0013
Reduction in diameter at point of rupture	do	.069
Reduction in area after rupture, per centum of original section		35.6
Position of rupture		".50 from neck
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3034.

Marks, $\overset{3\,W_2}{B\,L_2}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000200	.000200	.000050	.000050	
2, 000	10, 000	.000350	.000150	.000050	0.	
3, 000	15, 000	.000500	.000150	.000050	0.	
4, 000	20, 000	.000650	.000150	.000050	0.	
5, 000	25, 000	.000850	.000200	.000050	0.	
6, 000	30, 000	.001050	.000200	....	....	
6, 200	31, 000	.001100	.000050	....	....	
6, 400	32, 000	.001150	.000050	....	....	
6, 600	33, 000	.001200	.000050	....	....	Elastic limit.
6, 800	34, 000	.002100	.000900	....	....	
7, 000	35, 000	.014000	.011900	....	....	
7, 200	36, 000	.015000	.001000	....	....	
7, 400	37, 000	.015850	.000850	....	....	
7, 600	38, 000	.017000	.001150	....	....	
7, 800	39, 000	.018500	.001500	....	....	
8, 000	40, 000	.020000	.001500	....	....	
8, 400	42, 000	.023750	.003750	....	....	
8, 800	44, 000	.027750	.004000	....	....	
9, 200	46, 000	.031550	.003800	....	....	
9, 600	48, 000	.036250	.004700	....	....	
10, 000	50, 000	.041550	.005300	....	....	
10, 400	52, 000	.047500	.005950	....	....	
10, 800	54, 000	.054900	.007400	....	....	
11, 200	56, 000	.063750	.008850	....	....	
11, 600	58, 000	.074500	.010750	....	....	
12, 000	60, 000	.09	.0155	....	....	
12, 400	62, 000	.11	.0200	....	....	
12, 800	64, 000	.155	.0450	....	....	
12, 930	64, 650	.21	.055	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64, 650
Elastic limit per square inch of original section	do ...	33, 000
Elongation per inch after rupture	inch..	0. 365
Elongation per inch under strain at elastic limit	do ...	.001200
Reduction in diameter at point of rupture	do....	.215
Reduction in area after rupture, per centum of original section		66. 9
Position of rupture		″.95 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.22, .″51*

No. 3035.

Marks, $^{3}_{B}\,^{W_3}_{L_4}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200	0.	....	
2,000	10,000	.000350	.000150	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001050	.000200	....	....	
6,200	31,000	.001100	.000050	....	....	
6,400	32,000	.001150	.000050	....	....	
6,600	33,000	.001200	.000050	....	....	
6,800	34,000	.001250	.000050	....	....	
7,000	35,000	.001300	.000050	....	....	Elastic limit.
7,200	36,000	.009500	.008200	....	....	
7,400	37,000	.011500	.002000	....	....	
7,600	38,000	.018500	.007000	....	....	
7,800	39,000	.019000	.000500	....	....	
8,000	40,000	.019500	.000500	....	....	
8,400	42,000	.023000	.003500	....	....	
8,800	44,000	.025750	.002750	....	....	
9,200	46,000	.030000	.004250	....	....	
9,600	48,000	.034550	.004550	....	....	
10,000	50,000	.039250	.004700	....	....	
10,400	52,000	.044500	.005250	....	....	
10,800	54,000	.050600	.006100	....	....	
11,200	56,000	.058250	.007650	....	....	
11,600	58,000	.068500	.010250	....	....	
12,000	60,000	.079000	.010500	....	....	
12,400	62,000	.0950	.0160	....	....	
12,800	64,000	.1150	.0200	....	....	
13,200	66,000	.1600	.0450	....	....	
13,280	66,400	.2100	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	66,400
Elastic limit per square inch of original section	do	35,000
Elongation per inch after rupture	inch	0.2100
Elongation per inch under strain at elastic limit	do	.001300
Reduction in diameter at point of rupture	do	[illegible]
Reduction in area after rupture, per centum of original section		[illegible]
Position of rupture		1".19 from neck
Character of broken surface		fine silky
Elongation of inch sections		[illegible]

INGOT NO. 4.—*Lot No.* 3.

No. 3036.

Marks, $\overset{3\,W_{4}}{U\,T_{1}}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0007	.0001	0.	....	
2,400	30,000	.0009	.0002	....	....	
2,480	31,000	.0009	0.	....	....	
2,560	32,000	.0010	.0001	....	....	Elastic limit.
2,640	33,000	.0075	.0065	....	....	
2,720	34,000	.0101	.0026	....	....	
2,800	35,000	.0135	.0034	....	....	
2,880	36,000	.0145	.0010	....	....	
2,960	37,000	.0160	.0015	....	....	
3,040	38,000	.0173	.0013	....	....	
3,120	39,000	.0183	.0010	....	....	
3,200	40,000	.0202	.0019	....	....	
3,360	42,000	.0245	.0043	....	....	
3,520	44,000	.0285	.0040	....	....	
3,680	46,000	.0330	.0045	....	....	
3,840	48,000	.0375	.0045	....	....	
4,000	50,000	.0440	.0065	....	....	
4,160	52,000	.0500	.0060	....	....	
4,320	54,000	.0580	.0080	....	....	
4,480	56,000	.0660	.0080	....	....	
4,640	58,000	.08	.0140	....	....	
4,800	60,000	.09	.01	....	....	
4,960	62,000	.11	.02	....	....	
5,120	64,000	.14	.03	....	....	
5,180	64,750	.19	.05	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	64,750
Elastic limit per square inch of original section	do	32,000
Elongation per inch after rupture	inch	0.19
Elongation per inch under strain at elastic limit	do	.0010
Reduction in diameter at point of rupture	do	.049
Reduction in area after rupture, per centum of original section		28.4
Position of rupture		″.85 from neck
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3037.

Marks, $\substack{3\ W_4 \\ U\ T_2}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0002	.0002	0.	....	
800	10,000	.0003	.0001	0.	....	
1,200	15,000	.0004	.0001	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0008	.0002	0.	....	
2,400	30,000	.0009	.0001	....	....	
2,480	31,000	.0010	.0001	....	....	Elastic limit.
2,560	32,000	.0060	.0050	....	....	
2,640	33,000	.0098	.0038	....	....	
2,720	34,000	.0120	.0022	....	....	
2,800	35,000	.0137	.0017	....	....	
2,880	36,000	.0154	.0017	....	....	
2,960	37,000	.0170	.0016	....	....	
3,040	38,000	.0180	.0010	....	....	
3,120	39,000	.0192	.0012	....	....	
3,200	40,000	.0210	.0018	....	....	
3,360	42,000	.0241	.0031	....	....	
3,520	44,000	.0268	.0027	....	....	
3,680	46,000	.0285	.0017	....	....	
3,864	48,000	.0340	.0055	....	....	
4,000	50,000	.0400	.0060	....	....	
4,160	52,000	.0460	.0060	....	....	
4,320	54,000	.0521	.0061	....	....	
4,480	56,000	.0600	.0079	....	....	
4,640	58,000	.0725	.0125	....	....	
4,800	60,000	.0820	.0095	....	....	
4,960	62,000	.10	.018	....	....	
5,120	64,000	.12	.02	....	....	
5,260	65,750	.17	.05	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 65,750
Elastic limit per square inch of original section .... do.... 31,000
Elongation per inch after rupture .... inch.. 0.20
Elongation per inch under strain at elastic limit .... do ... .0010
Reduction in diameter at point of rupture .... do .... .049
Reduction in area after rupture, per centum of original section 28.4
Position of rupture .... ″.40 from neck
Character of broken surface .... silky, serrated. Opened cracks in stem

No. 3038.

Marks, $^{3\ W_4}_{U\ L_6}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000350	.000250	0.	....	
3,000	15,000	.000500	.000150	0.	....	
4,000	20,000	.000700	.000200	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001100	.000250	....	....	
6,200	31,000	.001200	.000100	....	....	
6,400	32,000	.001200	0.	....	....	
6,600	33,000	.001250	.000050	....	....	
6,800	34,000	.001300	.000050	....	....	
7,000	35,000	.001350	.000050	....	....	Elastic limit.
7,200	36,000	.013500	.012150	....	....	
7,400	37,000	.014250	.000750	....	....	
7,000	38,000	.014900	.000650	....	....	
7,800	39,000	.016250	.001350	....	....	
8,000	40,000	.017850	.001600	....	....	
8,400	42,000	.020600	.002750	....	....	
8,800	44,000	.024100	.003500	....	....	
9,200	46,000	.027400	.003300	....	....	
9,600	48,000	.032000	.004600	....	....	
10,000	50,000	.036750	.004750	....	....	
10,400	52,000	.042000	.005250	....	....	
10,800	54,000	.046900	.004900	....	....	
11,200	56,000	.053500	.006600	....	....	
11,600	58,000	.062000	.008500	....	....	
12,000	60,000	.072500	.010500	....	....	
12,400	62,000	.0850	.0125	....	....	
12,800	64,000	.1050	.0200	....	....	
13,200	66,000	.1400	.0350	....	....	
13,460	67,300	.2150	.0750	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	67,300
Elastic limit per square inch of original section	do....	35,000
Elongation per inch after rupture	inch..	0.3650
Elongation per inch under strain at elastic limit	do....	.001350
Reduction in diameter at point of rupture	do....	.205
Reduction in area after rupture, per centum of original section		64.6
Position of rupture		"1.15 from neck
Character of broken surface		fine silky
Elongation of inch sections		".50*, ".23

No. 3039.

Marks, $\overset{3\ W_4}{U\ L_4}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000700	.000.50	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001050	.000200	....	....	
6,200	31,000	.001100	.000050	....	....	
6,400	32,000	.001150	.000050	....	....	
6,600	33,000	.001200	.000050	....	....	
6,800	34,000	.001250	.000050	....	....	
7,000	35,000	.001300	.000050	....	....	
7,200	36,000	.001350	.000050	....	....	Elastic limit.
7,400	37,000	.015000	.013650	....	....	
7,600	38,000	.016000	.001000	....	....	
7,800	39,000	.017050	.001050	....	....	
8,000	40,000	.018750	.001700	....	....	
8,400	42,000	.021750	.003000	....	....	
8,800	44,000	.025000	.003250	....	....	
9,200	46,000	.028750	.003750	....	....	
9,600	48,000	.032550	.003800	....	....	
10,000	50,000	.037150	.004600	....	....	
10,400	52,000	.042500	.005350	....	....	
10,800	54,000	.048500	.006000	....	....	
11,200	56,000	.055750	.007250	....	....	
11,600	58,000	.064000	.008250	....	....	
12,000	60,000	.0750	.0110	....	....	
12,400	62,000	.0900	.0150	....	....	
12,800	64,000	.1100	.0200	....	....	
13,200	66,000	.1500	.0400	....	....	
13,360	66,800	.2100	0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 66,800
Elastic limit per square inch of original section...do .. 36,000
Elongation per inch after rupture...inch.. 0.2100
Elongation per inch under strain at elastic limit...do.... .001350
Reduction in diameter at point of rupture...do.... .195
Reduction in area after rupture, per centum of original section.......................... 62.1
Position of rupture...".95 from neck
Character of broken surface...fine silky
Elongation of inch sections...".23, "[illegible]

No. 3040.

Marks, $\overset{3\,W_{4}}{B\,T_{1}}$
Diameter, ".320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1, 000	0.	0.	0.	0.	Initial load.
400	5, 000	.0001	.0001	0.	....	
800	10, 000	.0002	.0001	0.	....	
1, 200	15, 000	.0003	.0001	0.	....	
1, 600	20, 000	.0005	.0002	0.	....	
2, 000	25, 000	.0007	.0002	0.	....	
2, 400	30, 000	.0009	.0002	....	....	
2, 480	31, 000	.0009	0.	....	....	
2, 560	32, 000	.0010	.0001	....	....	
2, 640	33, 000	0010	0.	....	....	
2, 720	34, 000	.0011	.0001	....	....	
2, 800	35, 000	.0011	0.	....	....	
2, 880	36, 000	.0013	.0001	....	....	Elastic limit
2, 960	37, 000	.0140	.0128	....	....	
3, 040	38, 000	.0180	.0040	....	....	
3, 120	39, 000	.0200	.0020	....	....	
3, 200	40, 000	.0217	.0017	....	....	
3, 360	42, 000	.0247	.0030	....	....	
3, 520	44, 000	.0292	.0045	....	....	
3, 680	46, 000	.0320	.0028	....	....	
3, 840	48, 000	.0370	.0050	....	....	
4, 000	50, 000	.0440	.0070	....	....	
4, 160	52, 000	.0510	.0070	....	....	
4, 320	54, 000	.0585	.0075	....	....	
4, 480	56, 000	.0690	.0105	....	....	
4, 640	58, 000	.0795	.0105	....	....	
4, 800	60, 000	.09	.0105	....	....	
4, 960	62, 000	.11	.02	....	....	
5, 120	64, 000	.16	.05	....	....	
5, 200	65, 000	.23	.07	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65, 000
Elastic limit per square inch of original section	do	36, 000
Elongation per inch after rupture	inch	0. 37
Elongation per inch under strain at elastic limit	do	.0012
Reduction in diameter at point of rupture	do	.100
Reduction in area after rupture, per centum of original section		52. 5
Position of rupture		".40 from neck
Character of broken surface		silky, serrated

No. 3041.

Marks, $^{3\ W_4}_{B\ T_2}$
Diameter, ".319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0002	.0002	0.	....	
800	10,000	.0004	.0002	0.	....	
1,200	15,000	.0005	.0001	0.	....	
1,600	20,000	.0007	.0002	0.	....	
2,000	25,000	.0008	.0001	0.	....	
2,400	30,000	.0010	.0002	....	....	
2,480	31,000	.0011	.0001	....	....	
2,560	32,000	.0011	0.	....	....	
2,640	33,000	.0012	.0001	....	....	
2,720	34,000	.0012	0.	....	....	
2,800	35,000	.0013 .0165	.0001 .0152	....	....	Elastic limit.
2,880	36,000	.0180	.0015	....	....	
2,960	37,000	.0189	.0009	....	....	
3,040	38,000	.0198	.0009	....	....	
3,120	39,000	.0213	.0015	....	....	
3,200	40,000	.0226	.0013	....	....	
3,360	42,000	.0275	.0049	....	....	
3,520	44,000	.0302	.0027	....	....	
3,680	46,000	.0340	.0038	....	....	
3,840	48,000	.0398	.0058	....	....	
4,000	50,000	.0465	.0067	....	....	
4,160	52,000	.0513	.0048	....	....	
4,320	54,000	.0595	.0082	....	....	
4,480	56,000	.0690	.0095	....	....	
4,640	58,000	.0844	.0154	....	....	
4,800	60,000	.10	.0156	....	....	
4,960	62,000	.12	.02	....	....	
5,120	64,000	.19	.07	....	....	
5,160	64,500	.25	.06	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds .. 64,500
Elastic limit per square inch of original section .... do ... 35,000
Elongation per inch after rupture .... inch ... 0.24
Elongation per inch under strain at elastic limit .... do ... .0013
Reduction in diameter at point of rupture .... do ... .088
Reduction in area after rupture, per centum of original section 47.5
Position of rupture .... ".25 from neck
Character of broken surface .... silky, serrated. Opened cracks in stem

No. 3042.

Marks, $^{3\,W_4}_{B\,L_3}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000300	.000200	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	....	....	
6,200	31,000	.001050	.000050	....	....	
6,400	32,000	.001100	.000050	....	....	
6,600	33,000	.001200	.000100	....	....	Elastic limit.
6,800	34,000	.001400	.000200	....	....	
7,000	35,000	.006000	.004600	....	....	
7,200	36,000	.016500	.010500	....	....	
7,400	37,000	.017050	.000550	....	....	
7,600	38,000	.018400	.001350	....	....	
7,800	39,000	.019900	.001500	....	....	
8,000	40,000	.021500	.001600	....	....	
8,400	42,000	.025000	.003500	....	....	
8,800	44,000	.028900	.003900	....	....	
9,200	46,000	.033250	.004350	....	....	
9,600	48,000	.038000	.004750	....	....	
10,000	50,000	.043750	.005750	....	....	
10,400	52,000	.050750	.007000	....	....	
10,800	54,000	.058750	.008000	....	....	
11,200	56,000	.068000	.009250	....	....	
11,600	58,000	.08	.012	....	....	
12,000	60,000	.095	.015	....	....	
12,400	62,000	.12	.025	....	....	
12,800	64,000	.18	.060	....	....	
12,820	64,100	.205	.025	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	64,100
Elastic limit per square inch of original section	do	33,000
Elongation per inch after rupture	inch	0.3850
Elongation per inch under strain at elastic limit	do	.001200
Reduction in diameter at point of rupture	do	.215
Reduction in area after rupture, per centum of original section		66.9
Position of rupture		1″.25 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.47, ″.30

No. 3041.

Marks, $^{3}{}^{W_4}_{B\ T_2}$
Diameter, ".319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0002	.0002	0.	....	
800	10,000	.0004	.0002	0.	....	
1,200	15,000	.0005	.0001	0.	....	
1,600	20,000	.0007	.0002	0.	....	
3,000	25,000	.0008	.0001	0.	....	
2,400	30,000	.0010	.0002	....	....	
2,480	31,000	.0011	.0001	....	....	
2,560	32,000	.0011	0.	....	....	
2,640	33,000	.0012	.0001	....	....	
2,720	34,000	.0012	0.	....	....	
2,800	35,000	.0013 .0165	.0001 .0152	....	....	Elastic limit.
2,880	36,000	.0180	.0015	....	....	
2,960	37,000	.0189	.0009	....	....	
3,040	38,000	.0198	.0009	....	....	
3,120	39,000	.0218	.0015	....	....	
3,200	40,000	.0226	.0018	....	....	
3,360	42,000	.0275	.0049	....	....	
3,520	44,000	.0302	.0027	....	....	
3,680	46,000	.0340	.0038	....	....	
3,840	48,000	.0398	.0058	....	....	
4,000	50,000	.0465	.0067	....	....	
4,160	52,000	.0513	.0048	....	....	
4,320	54,000	.0595	.0082	....	....	
4,480	56,000	.0690	.0095	....	....	
4,640	58,000	.0844	.0154	....	....	
4,800	60,000	.10	.0156	....	....	
4,960	62,000	.12	.02	....	....	
5,120	64,000	.19	.07	....	....	
5,160	64,500	.25	.06	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 64,500
Elastic limit per square inch of original section .... do ... 35,000
Elongation per inch after rupture .... inch... 0.34
Elongation per inch under strain at elastic limit .... do.... .0013
Reduction in diameter at point of rupture .... do ... .080
Reduction in area after rupture, per centum of original section 47.5
Position of rupture .... ".35 from neck
Character of broken surface .... silky, serrated. Opened cracks in stem

INGOT NO. 5.—*Lot No. 3.*

No. 3044.

Marks, $\overset{3}{U}\overset{W_5}{T_1}$
Diameter, ″.319,
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0008	.0002	0.	....	
2,400	30,000	.0010	.0002	....	....	
2,480	31,000	.0010	0.	....	....	
2,560	32,000	.0011	.0001	....	....	
2,640	33,000	.0011	0.	....	....	
2,720	34,000	.0012	.0001	....	....	Elastic limit.
2,800	35,000	.0153	.0141	....	....	
2,880	36,000	.0160	.0007	....	....	
2,960	37,000	.0172	.0012	....	....	
3,040	38,000	.0180	.0008	....	....	
3,120	39,000	.0190	.0010	....	....	
3,200	40,000	.0212	.0022	....	....	
3,360	42,000	.0253	.0041	....	....	
3,520	44,000	.0278	.0025	....	....	
3,680	46,000	.0317	.0039	....	....	
3,840	48,000	.0355	.0038	....	....	
4,000	50,000	.0410	.0025	....	....	
4,160	52,000	.0485	.0075	....	....	
4,320	54,000	.0560	.0075	....	....	
4,480	56,000	.0620	.0060	....	....	
4,640	58,000	.0740	.0120	....	....	
4,800	60,000	.0850	.0110	....	....	
4,960	62,000	.10	.015	....	....	
5,120	64,000	.13	.03	....	....	
5,200	65,000	.15	.02	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	65,000
Elastic limit per square inch of original section	do....	34,000
Elongation per inch after rupture	inch..	0.17
Elongation per inch under strain at elastic limit	do....	.0011
Reduction in diameter at point of rupture	do....	.049
Reduction in area after rupture, per centum of original section		28.4
Position of rupture		″.2 from neck
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3043.

Marks, $\overset{3\,W_4}{B\,L_4}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000500	.000200	0.	....	
4,000	20,000	.000650	.000150	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	....	....	
6,200	31,000	.001050	.000050	....	....	
6,400	32,000	.001100	.000050	....	....	
6,600	33,000	.001150	.000050	....	....	
6,800	34,000	.001250	.000100	....	....	Elastic limit.
7,000	35,000	.001400	.000150	....	....	
7,200	36,000	.007250	.005850	....	....	
7,400	37,000	.017000	.009750	....	....	
7,600	38,000	.018500	.001500	....	....	
7,800	39,000	.019600	.001800	....	....	
8,000	40,000	.021500	.001700	....	....	
8,400	42,000	.024700	.003200	....	....	
8,800	44,000	.028250	.003550	....	....	
9,200	46,000	.032800	.004550	....	....	
9,600	48,000	.038050	.005250	....	....	
10,000	50,000	.043500	.005450	....	....	
10,400	52,000	.049750	.006250	....	....	
10,800	54,000	.058500	.008750	....	....	
11,200	56,000	.067000	.008500	....	....	
11,600	58,000	.078500	.011500	....	....	
12,000	60,000	.0950	.0165	....	....	
12,400	62,000	.1200	.0250	....	....	
12,800	64,000	.1850	.0650	....	....	
12,890	64,450	.2350	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64,450
Elastic limit per square inch of original section	do....	34,000
Elongation per inch after rupture	inch..	0.3000
Elongation per inch under strain at elastic limit	do....	.001250
Reduction in diameter at point of rupture	do....	.215
Reduction in area after rupture, per centum of original section		66.9
Position of rupture		1″.25 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.67″, ″.31

No. 3046.

Marks, $\substack{3\ W,\\ U\ L,}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001050	.000200	....	....	
6,200	31,000	.001100	.000050	....	....	Elastic limit.
6,400	32,000	.003400	.002300	....	....	
6,600	33,000	.004550	.001150	....	....	
6,800	34,000	.006100	.001550	....	....	
7,000	35,000	.007750	.001650	....	....	
7,200	36,000	.012750	.005000	....	....	
7,400	37,000	.014500	.001750	....	....	
7,600	38,000	.015500	.001000	....	....	
7,800	39,000	.016500	.001000	....	....	
8,000	40,000	.017900	.001400	....	....	
8,400	42,000	.021000	.003100	....	....	
8,800	44,000	.024500	.003500	....	....	
9,200	46,000	.028500	.004000	....	....	
9,600	48,000	.033250	.004750	....	....	
10,000	50,000	.037250	.004000	....	....	
10,400	52,000	.042750	.005500	....	....	
10,800	54,000	.048500	.005750	....	....	
11,200	56,000	.056000	.007500	....	....	
11,600	58,000	.063750	.007750	....	....	
12,000	60,000	.074000	.010250	....	....	
12,400	62,000	.09	.016	....	....	
12,800	64,000	.11	.02	....	....	
13,200	66,000	.15	.04	....	....	
13,370	66,850	.21	.06	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	66,850
Elastic limit per square inch of original section	do	31,000
Elongation per inch after rupture	inch	0.36
Elongation per inch under strain at elastic limit	do	.0011
Reduction in diameter at point of rupture	do	.195
Reduction in area after rupture, per centum of original section		62.2
Position of rupture		1″.15 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.25, ″.47*

No. 3045.

Marks, $\overset{3\ \mathrm{W}_6}{\mathrm{U\ T}_2}$
Diameter, ".319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0007	.0001	0.	....	
2,400	30,000	.0009	.0002	....	....	
2,480	31,000	.0010	.0001	....	....	
2,560	32,000	.0010	0.	....	....	
2,640	33,000	.0011	.0001	....	....	Elastic limit.
2,720	34,000	.0145	.0134	....	....	
2,800	35,000	.0155	.0010	....	....	
2,880	36,000	.0165	.0010	....	....	
2,960	37,000	.0178	.0013	....	....	
3,040	38,000	.0190	.0012	....	....	
3,120	39,000	.0205	.0015	....	....	
3,200	40,000	.0230	.0025	....	....	
3,360	42,000	.0270	.0040	....	....	
3,520	44,000	.0310	.0040	....	....	
3,680	46,000	.0350	.0040	....	....	
3,840	48,000	.0390	.0040	....	....	
4,000	50,000	.0460	.0070	....	....	
4,160	52,000	.0531	.0071	....	....	
4,320	54,000	.0610	.0079	....	....	
4,480	56,000	.0692	.0082	....	....	
4,640	58,000	.0840	.0148	....	....	
4,800	60,000	.10	.016	....	....	
4,960	62,000	.13	.03	....	....	
5,110	63,875	.22	.09	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	63,875
Elastic limit per square inch of original section	do ...	33,000
Elongation per inch after rupture	inch..	0.30
Elongation per inch under strain at elastic limit	do....	.0011
Reduction in diameter at point of rupture	do....	.069
Reduction in area after rupture, per centum of original section		38.6
Position of rupture		".55 from neck
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3048.

Marks, $^{3\,W}_{B\,T_1}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.		
800	10,000	.0003	.0002	0.		
1,200	15,000	.0005	.0002	0.		
1,600	20,000	.0007	.0002	0.		
2,000	25,000	.0009	.0002	0.		
2,400	30,000	.0010	.0001			
2,480	31,000	.0011	.0001			
2,560	32,000	.0011	0.			
2,640	33,000	.0112	.0001			Elastic limit.
2,720	34,000	.0156	.0144			
2,800	35,000	.0162	.0006			
2,880	36,000	.0170	.0008			
2,960	37,000	.0180	.0010			
3,040	38,000	.0198	.0018			
3,120	39,000	.0212	.0014			
3,200	40,000	.0231	.0019			
3,360	42,000	.0278	.0047			
3,520	44,000	.0317	.0039			
3,680	46,000	.0357	.0040			
3,840	48,000	.0395	.0038			
4,000	50,000	.0460	.0065			
4,160	52,000	.0531	.0071			
4,320	54,000	.0610	.0079			
4,480	56,000	.0735	.0125			
4,640	58,000	.0850	.0115			
4,800	60,000	.10	.015			
4,960	62,000	.12	.02			
5,120	64,000	.19	.07			
5,130	64,125	.23	.04			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64,125
Elastic limit per square inch of original section	do	33,000
Elongation per inch after rupture	inch..	0.32
Elongation per inch under strain at elastic limit	do	.0012
Reduction in diameter at point of rupture	do	.069
Reduction in area after rupture, per centum of original section		38.9
Position of rupture		″.50 from neck
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3049.

Marks, $^{3}_{B}\,^{W_{5}}_{T_{2}}$
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	....	....	
800	10,000	.0002	.0001	....	....	
1,200	15,000	.0004	.0002	....	....	
1,600	20,000	.0005	.0001	....	....	
2,000	25,000	.0007	.0002	....	....	
2,400	30,000	.0009	.0002	....	....	Elastic limit.
2,480	31,000	.0014	.0005	....	....	
2,560	32,000	.0040	.0026	....	....	
2,640	33,000	.0060	.0020	....	....	
2,720	34,000	.0110	.0050	....	....	
2,800	35,000	.0130	.0020	....	....	
2,880	36,000	.0142	.0012	....	....	
2,960	37,000	.0158	.0016	....	....	
3,040	38,000	.0175	.0017	....	....	
3,120	39,000	.0188	.0013	....	....	
3,200	40,000	.0203	.0015	....	....	
3,360	42,000	.0240	.0037	....	....	
3,520	44,000	.0270	.0030	....	....	
3,680	46,000	.0315	.0045	....	....	
3,840	48,000	.0355	.0040	....	....	
4,000	50,000	.0420	.0065	....	....	
4,160	52,000	.0480	.0060	....	....	
4,320	54,000	.0540	.0060	....	....	
4,480	56,000	.0645	.0105	....	....	
4,640	58,000	.0750	.0105	....	....	
4,800	60,000	.09	.015	....	....	
4,960	62,000	.11	.02	....	....	
5,120	64,000	.12	.01	....	....	
5,240	65,500	.23	.11	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	65,500
Elastic limit per square inch of original section	do	30,000
Elongation per inch after rupture	inch..	0.23
Elongation per inch under strain at elastic limit	do....	.0009
Reduction in diameter at point of rupture	do....	.069
Reduction in area after rupture, per centum of original section		38.6
Position of rupture		″.50 from neck
Character of broken surface		silky, serrated. Opened cracks in stem

No. 3050.

Marks, $\overset{3\,\mathrm{W}_3}{\mathrm{B\,L}_2}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.001000	.000200	....	....	
6,200	31,000	.001050	.000050	....	....	
6,400	32,000	.001100	.000050	....	....	
6,600	33,000	.001150	.000050	....	....	
6,800	34,000	.001200	.000050	....	....	Elastic limit.
7,000	35,000	.010750	.009550	....	....	
7,200	36,000	.014500	.003750	....	....	
7,400	37,000	.016250	.001700	....	....	
7,600	38,000	.017500	.001250	....	....	
7,800	39,000	.019000	.001500	....	....	
8,000	40,000	.020750	.001750	....	....	
8,400	42,000	.024500	.003750	....	....	
8,800	44,000	.025850	.001350	....	....	
9,200	46,000	.032000	.006150	....	....	
9,600	48,000	.037500	.005500	....	....	
10,000	50,000	.042250	.004750	....	....	
10,400	52,000	.048500	.006250	....	....	
10,800	54,000	.056000	.007500	....	....	
11,200	56,000	.063750	.007750	....	....	
11,600	58,000	.076000	.012250	....	....	
12,000	60,000	.09	.014	....	....	
12,400	62,000	.11	.02	....	....	
12,800	64,000	.15	.04	....	....	
13,010	65,050	.22	.07	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	65,050
Elastic limit per square inch of original section	do....	34,000
Elongation per inch after rupture	inch..	0.36
Elongation per inch under strain at elastic limit	do....	.0012
Reduction in diameter at point of rupture	do....	.195
Reduction in area after rupture, per centum of original section	..	62.2
Position of rupture		1".95 from neck
Character of broken surface		fine silky
Elongation of inch sections		".50*, ".22

No. 3051.

Marks, $\overset{8\,W_1}{B\,L_4}$
Diameter, ″.505
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000100	.000100	0.		
2, 000	10, 000	.000250	.000150	0.		
3, 000	15, 000	.000450	.000200	0.		
4, 000	20, 000	.000600	.000150	0.		
5, 000	25, 000	.000800	.000200	0.		
6, 000	30, 000	.001000	.000200			
6, 200	31, 000	.001050	.000050			
6, 400	32, 000	.001050	0.			
6, 600	33, 000	.001100	.000050			
6, 800	34, 000	.001150	.000050			Elastic limit.
7, 000	35, 000	.015250	.014100			
7, 200	36, 000	.016000	.000750			
7, 400	37, 000	.017000	.001000			
7, 600	38, 000	.017750	.000750			
7, 800	39, 000	.018750	.001000			
8, 000	40, 000	.021500	.002750			
8, 400	42, 000	.025250	.003750			
8, 800	44, 000	.029250	.004000			
9, 200	46, 000	.033750	.004500			
9, 600	48, 000	.038500	.004750			
10, 000	50, 000	.043750	.005250			
10, 400	52, 000	.050500	.006750			
10, 800	54, 000	.058000	.007500			
11, 200	56, 000	.067000	.009000			
11, 600	58, 000	.077750	.010750			
12, 000	60, 600	.09	.012250			
12, 400	62, 000	.11	.02			
12, 800	64, 000	.16	.05			
12, 910	64, 550	.21	.05			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64, 550
Elastic limit per square inch of original section	do....	34, 000
Elongation per inch after rupture	inch..	0.26
Elongation per inch under strain at elastic limit	do....	.001150
Reduction in diameter at point of rupture	do....	.195
Reduction in area after rupture, per centum of original section		62.2
Position of rupture		1″.05 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.40, ″.28

INGOT No. 6.—*Lot No.* 3.

No. 3100.

Marks, $^{3\,W_6}_{U\,T_1}$
Diameter, ″.320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0003	.0002	0.	....	
1,200	15,000	.0004	.0001	0.	....	
1,600	20,000	.0005	.0001	0.	....	
2,000	25,000	.0007	.0002	0.	....	
2,400	30,000	.0009	.0002	0.	....	
2,800	35,000	.0010	.0001	....	....	
2,880	36,000	.0010	0.	....	....	
2,960	37,000	.0011	.0001	....	....	
3,040	38,000	.0011	0.	....	....	
3,120	39,000	.0012	.0001	....	....	
3,200	40,000	.0012	0.	....	....	
3,280	41,000	.0012	0.	....	....	Elastic limit.
3,360	42,000	.0290	.0278	....	....	
3,520	44,000	.0310	.0020	....	....	
3,680	46,000	.0331	.0021	....	....	
3,840	48,000	.0375	.0044	....	....	
4,000	50,000	.0450	.0075	....	....	
4,160	52,000	.0510	.0060	....	....	
4,320	54,000	.0600	.0090	....	....	
4,480	56,000	.0690	.0090	....	....	
4,640	58,000	.0817	.0127	....	....	
4,800	60,000	.0950	.0133	....	....	
4,960	62,000	.11	.0150	....	....	
5,120	64,000	.17	.06	....	....	
5,160	64,500	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	64,500
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.32
Elongation per inch under strain at elastic limit	do	.0012
Reduction in diameter at point of rupture	do	.100
Reduction in area after rupture, per centum of original section		52.5
Position of rupture		″.25 from neck
Character of broken surface		silky, serrated

No. 3051.

Marks, $^{S\ W_1}_{B\ L_4}$
Diameter, ".505
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000800	.000200	0.	....	
6,000	30,000	.001000	.000200	....	....	
6,200	31,000	.001050	.000050	....	....	
6,400	32,000	.001050	0.	....	....	
6,600	33,000	.001100	.000050	....	....	
6,800	34,000	.001150	.000050	....	....	Elastic limit.
7,000	35,000	.015250	.014100	....	....	
7,200	36,000	.016000	.000750	....	....	
7,400	37,000	.017000	.001000	....	....	
7,600	38,000	.017750	.000750	....	....	
7,800	39,000	.018750	.001000	....	....	
8,000	40,000	.021500	.002750	....	....	
8,400	42,000	.025250	.003750	....	....	
8,800	44,000	.029250	.004000	....	....	
9,200	46,000	.033750	.004500	....	....	
9,600	48,000	.038500	.004750	....	....	
10,000	50,000	.043750	.005250	....	....	
10,400	52,000	.050500	.006750	....	....	
10,800	54,000	.058000	.007500	....	....	
11,200	56,000	.067000	.009000	....	....	
11,600	58,000	.077750	.010750	....	....	
12,000	60,000	.09	.012250	....	....	
12,400	62,000	.11	.02	....	....	
12,800	64,000	.16	.05	....	....	
12,910	64,550	.21	.05	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 64,550
Elastic limit per square inch of original section .... do.... 34,000
Elongation per inch after rupture .... inch.. 0.36
Elongation per inch under strain at elastic limit .... do.... .001150
Reduction in diameter at point of rupture .... do.... .195
Reduction in area after rupture, per centum of original section 62.1
Position of rupture .... 1".05 from neck
Character of broken surface .... fine silky
Elongation of inch sections .... ".40, ".3[illegible]

No. 3102.

Marks, $\overset{3\text{ W.}}{\text{U L.}}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000960	.000200	0.	....	
6,200	31,000	.001000	.000050	....	....	
6,400	32,000	.001000	0.	....	....	
6,600	33,000	.001050	.000050	....	....	
6,800	34,000	.001050	0.	....	....	
7,000	35,000	.001100	.000050	....	....	
7,200	36,000	.001100	0.	....	....	
7,400	37,000	.001150	.000050	....	....	
7,600	38,000	.001200	.000050	....	....	Elastic limit.
7,800	39,000	.018750	.017550	....	....	
8,000	40,000	.020500	.001750	....	....	
8,400	42,000	.023250	.002750	....	....	
8,800	44,000	.029000	.005750	....	....	
9,200	46,000	.030250	.001250	....	....	
9,600	48,000	.034750	.004500	....	....	
10,000	50,000	.040050	.005300	....	....	
10,400	52,000	.046000	.005950	....	....	
10,800	54,000	.052500	.006500	....	....	
11,200	56,000	.061000	.008500	....	....	
11,600	58,000	.071250	.010250	....	....	
12,000	60,000	.0850	.013750	....	....	
12,400	62,000	.1000	.0150	....	....	
12,800	64,000	.1200	.0200	....	....	
13,170	65,850	.2450	.1250	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	65,850
Elastic limit per square inch of original section	do...	38,000
Elongation per inch after rupture	inch..	0.3750
Elongation per inch under strain at elastic limit	do ...	.001200
Reduction in diameter at point of rupture	do....	.215
Reduction in area after rupture, per centum of original section		66.9
Position of rupture		″.95 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.52*, ″.23

No. 3096.

Marks, $^{3\ W_6}_{B\ T_1}$
Diameter, ″.320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0003	.0002	0.	....	
1,200	15,000	.0005	.0002	0.	....	
1,600	20,000	.0007	.0002	0.	....	
2,000	25,000	.0008	.0001	....	....	
2,320	29,000	.0009	.0001	....	....	Elastic limit.
2,400	30,000	.0015	.0006	.0006	.0006	
2,480	31,000	.0020	.0005	....	....	
2,560	32,000	.0026	.0006	....	....	
2,640	33,000	.0100	.0074	....	....	
2,720	34,000	.0136	.0036	....	....	
2,800	35,000	.0150	.0014	....	....	
2,880	36,000	.0162	.0012	....	....	
2,960	37,000	.0175	.0013	....	....	
3,040	38,000	.0190	.0015	....	....	
3,120	39,000	.0201	.0011	....	....	
3,200	40,000	.0217	.0016	....	....	
3,360	42,000	.0240	.0023	....	....	
3,520	41,000	.0283	.0043	....	....	
3,680	46,000	.0317	.0034	....	....	
3,840	48,000	.0368	.0051	....	....	
4,000	50,000	.0450	.0082	....	....	
4,160	52,000	.0520	.0070	....	....	
4,320	54,000	.0575	.0055	....	....	
4,480	56,000	.0677	.0102	....	....	
4,640	58,000	.0800	.0123	....	....	
4,800	60,000	.0950	.0150	....	....	
4,960	62,000	.1050	.0100	....	....	
5,120	64,000	.15	.045	....	....	
5,210	65,125	.22	.07	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,125
Elastic limit per square inch of original section	do	29,000
Elongation per inch after rupture	inch	0.22
Elongation per inch under strain at elastic limit	do	.0009
Reduction in diameter at point of rupture	do	.050
Reduction in area after rupture, per centum of original section		28.4
Position of rupture		″.45 from neck
Character of broken surface		silky, serrated. Opened cracks in surface of stem

No. 3097.

Marks, $^{3\,W_{4}}_{B\,T}$,
Diamater, ".320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.		
800	10,000	.0002	.0001	0.		
1,200	15,000	.0003	.0001	0.		
1,600	20,000	.0005	.0002	0.		
2,000	25,000	.0008	.0003	0.		
2,400	30,000	.0009	.0001	0.		
2,480	31,000	.0010	.0001			Elastic limit.
2,560	32,000	.0029	.0019			
2,640	33,000	.0041	.0012			
2,720	34,000	.0080	.0039			
2,800	35,000	.0104	.0024			
2,880	36,000	.0130	.0026			
2,960	37,000	.0170	.0040			
3,040	38,000	.0192	.0022			
3,120	39,000	.0212	.0020			
3,200	40,000	.0240	.0028			
3,360	42,000	.0270	.0030			
3,520	44,000	.0290	.0020			
3,680	46,000	.0360	.0070			
3,840	48,000	.0400	.0040			
4,000	50,000	.0452	.0052			
4,160	52,000	.0526	.0074			
4,320	54,000	.0605	.0079			
4,480	56,000	.0721	.0116			
4,640	58,000	.0875	.0154			
4,800	60,000	.10	.0125			
4,960	62,000	.115	.015			
5,120	64,000	.20	.085			
5,150	64,375					Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	64,375
Elastic limit per square inch of original section	do	31,000
Elongation per inch after rupture	inch	0.31
Elongation per inch under strain at elastic limit	do	.0010
Reduction in diameter at point of rupture	do	.050
Reduction in area after rupture, per centum of original section		28.4
Position of rupture		at middle of stem
Character of broken surface		silky, serrated. Opened cracks in surface of stem

No. 3098.

Marks, $^{3}{}^{W_{6}}_{B\,L_{2}}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
6,200	31,000	.001050	.000050	....	....	
6,400	32,000	.001100	.000050	....	....	
6,600	33,000	.001100	0.	....	....	
6,800	34,000	.001150	.000050	....	....	
7,000	35,000	.001150	0.	....	....	
7,200	36,000	.001200	.000050	....	....	Elastic limit.
7,400	37,000	.001600	.000400	....	....	
7,600	38,000	.018500	.016900	....	....	
6,800	39,000	.019550	.001050	....	....	
8,000	40,000	.020350	.000800	....	....	
8,400	42,000	.023250	.002900	....	....	
8,800	44,000	.026750	.003500	....	....	
9,200	46,000	.030750	.004000	....	....	
9,600	48,000	.035500	.004750	....	....	
10,000	50,000	.041000	.005510	....	....	
10,400	52,000	.046750	.005750	....	....	
10,800	54,000	.053750	.007000	....	....	
11,200	56,000	.061250	.007500	....	....	
11,600	58,000	.068750	.007500	....	....	
12,000	60,000	.0650	.016250	....	....	
12,400	62,000	.1000	.0150	....	....	
12,800	64,000	.1250	.0250	....	....	
13,000	66,450	.2150	.0900	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	65,450
Elastic limit per square inch of original section	do....	36,000
Elongation per inch after rupture.	inch..	0.2150
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.215
Reduction in area after rupture, per centum of original section		66.9
Position of rupture		1″.10 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.27, ″.50″

No. 3099.

Marks, $^{3\,W_{8}}_{B\,L_{4}}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000650	.000200	0.	....	
5,000	25,000	.000850	.000200	0.	....	
6,000	30,000	.001000	.000150	0.	....	
6,200	31,000	.001050	.000050	....	....	
6,400	32,000	.001050	0.	....	....	
6,600	33,000	.001150	.000100	....	....	
6,800	34,000	.001150	0.	....	....	
7,000	35,000	.001200	.000050	....	....	
7,200	36,000	.001250	.000050	....	....	
7,400	37,000	.001300	.000050	....	....	
7,600	38,000	.001300	0.	....	....	Elastic limit.
7,800	39,000	.019000	.017700	....	....	
8,000	40,000	.020250	.001250	....	....	
8,400	42,000	.023250	.003000	....	....	
8,800	44,000	.026750	.003500	....	....	
9,200	46,000	.030650	.003900	....	....	
9,600	48,000	.035250	.004600	....	....	
10,000	50,000	.040600	.005350	....	....	
10,400	52,000	.046000	.005400	....	....	
10,800	54,000	.053250	.007250	....	....	
11,200	56,000	.060500	.007250	....	....	
11,600	58,000	.070600	.010100	....	....	
12,000	60,000	.0850	.0144	....	....	
12,400	62,000	.1000	.0150	....	....	
12,800	64,000	.1200	.0200	....	....	
13,180	65,900	.2200	.1000	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds..	65,900
Elastic limit per square inch of original section....................do ...	38,000
Elongation per inch after rupture....................inch..	.03800
Elongation per inch under strain at elastic limit....................do....	.001300
Reduction in diameter at point of rupture....................do....	.215
Reduction in area after rupture, per centum of original section....................	66.9
Position of rupture....................	1″.15 from neck
Character of broken surface....................	fine silky
Elongation of inch sections....................	″.52*, ″.24*

INGOT NO. 7.—*Lot No.* 3.

No. 3212.

Marks, $^{8}_{U}{}^{W_7}_{T_1}$
Diameter, ".320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0005	.0001	0.	....	
2,000	25,000	.0007	.0002	0.	....	
2,400	30,000	.0009	.0002	0.	....	
2,480	31,000	.0009	0.	....	....	
2,560	32,000	.0010	.0001	....	....	
2,640	33,000	.0010	0.	....	....	
2,720	34,000	.0011	.0001	....	....	
2,800	35,000	.0011	0.	....	....	
2,880	36,000	.0012	.0001	....	....	Elastic limit.
2,960	37,000	.0019	.0007	....	....	
3,040	38,000	.0085	.0066	....	....	
3,120	39,000	.0140	.0055	....	....	
3,200	40,000	.0250	.0110	....	....	
3,360	42,000	.0280	.0030	....	....	
3,520	44,000	.0295	.0015	....	....	
3,680	46,000	.0315	.0020	....	....	
3,840	48,000	.0376	.0061	....	....	
4,000	50,000	.0445	.0069	....	....	
4,160	52,000	.0510	.0065	....	....	
4,320	54,000	.0580	.0070	....	....	
4,480	56,000	.0720	.0140	....	....	
4,640	58,000	.0800	.0080	....	....	
4,800	60,000	.10	.020	....	....	
4,960	62,000	.115	.015	....	....	
5,120	64,000	.16	.045	....	....	
5,150	64,875	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds.. 64,875
Elastic limit per square inch of original section..................................do.... 36,000
Elongation per inch after rupture..................................inch.. .02
Elongation per inch under strain at elastic limit..................................do.... .0012
Reduction in diameter at point of rupture..................................do.... .050
Reduction in area after rupture, per centum of original section.................................. 28.4
Position of rupture..................................".50 from neck
Character of broken surface..................................silky, serrated. Opened cracks in surface of stem

No. 3213.

Marks, $\overset{3\ W_7}{U\ T_3}$
Diameter, ".320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0007	.0001	0.	....	
2,400	30,000	.0009	.0002	0.	....	
2,480	31,000	.0010	.0001	....	....	
2,560	32,000	.0010	0.	....	....	
2,640	33,000	.0011	.0001	....	....	
2,720	34,000	.0012	.0001	....	....	
2,800	35,000	.0012	0.	....	....	
2,880	36,000	.0013	.0001	....	....	
2,960	37,000	.0014	.0001	....	....	
3,040	38,000	.0014	0.	....	....	
3,120	39,000	.0015	.0001	....	....	Elastic limit.
3,200	40,000	.0030	.0015	....	....	
3,360	42,000	.0272	.0242	....	....	
3,520	44,000	.0292	.0020	....	....	
3,680	46,000	.0326	.0034	....	....	
3,840	48,000	.0365	.0039	....	....	
4,000	50,000	.0430	.0065	....	....	
4,160	52,000	.0495	.0065	....	....	
4,320	54,000	.0564	.0069	....	....	
4,480	56,000	.0658	.0094	....	....	
4,640	58,000	.0800	.0142	....	....	
4,800	60,000	.095	.015	....	....	
4,960	62,000	.105	.010	....	....	
5,120	64,000	.15	.045	....	....	
5,210	65,125	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,125
Elastic limit per square inch of original section	do.	39,000
Elongation per inch after rupture	inch	0.22
Elongation per inch under strain at elastic limit	do.	.0015
Reduction in diameter at point of rupture	do.	.050
Reduction in area after rupture, per centum of original section		28.4
Position of rupture		".60 from neck
Character of broken surface		silky, serrated. Opened cracks in surface of stem

No. 3214.

Marks, 3 W, U L.
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	0.	....	
6,200	31,000	.000950	.000050	....	....	
6,400	32,000	.000950	0.	....	....	
6,600	33,000	.001000	.000050	....	....	
6,800	34,000	.001050	.000050	....	....	
7,000	35,000	.001100	.000050	....	....	
7,200	36,000	.001150	.000050	....	....	
7,400	37,000	.001200	.000050	....	....	
7,600	38,000	.001250	.000050	....	....	Elastic limit.
7,800	39,000	.002100	.000850	....	....	
8,000	40,000	.006000	.003900	....	....	
8,400	42,000	.023800	.017800	....	....	
8,800	44,000	.026000	.002200	....	....	
9,200	46,000	.029550	.003550	....	....	
9,600	48,000	.033250	.003700	....	....	
10,000	50,000	.038500	.005250	....	....	
10,400	52,000	.044000	.005500	....	....	
10,800	54,000	.050750	.006750	....	....	
11,200	56,000	.057000	.006250	....	....	
11,600	58,000	.065500	.008500	....	....	
12,000	60,000	.0800	.0145	....	....	
12,400	62,000	.0950	.0150	....	....	
12,800	64,000	.1100	.0150	....	....	
13,200	66,000	.1500	.0400	....	....	
13,320	66,600	.2100	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	66,600
Elastic limit per square inch of original section	do	38,000
Elongation per inch after rupture	inch	0.3700
Elongation per inch under strain at elastic limit	do	.001250
Reduction in diameter at point of rupture	do	.205
Reduction in area after rupture, per centum of original section		64.6
Position of rupture		middle of stem
Character of broken surface		fine silky
Elongation of inch sections		″.43, ″.31

No. 3215.

Marks, $\substack{3\ W_7 \\ U\ L_4}$
Diameter, ''.506.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000550	.000150	0.	....	
5,000	25,000	.000750	.000200	0.	....	
6,000	30,000	.000900	.000150	0.	....	
6,200	31,000	.000950	.000050	....	....	
6,400	32,000	.001000	.000050	....	....	
6,600	33,000	.001050	.000050	....	....	
6,800	34,000	.001100	.000050	....	....	
7,000	35,000	.001200	000100	....	....	
7,200	36,000	.001250	.000050	....	....	
7,400	37,000	.001300	.000050	....	....	
7,600	38,000	.001400	.000100	....	....	Elastic limit.
7,800	39,000	.003500	.002100	....	....	
8,000	40,000	.007000	.003500	....	....	
8,400	42,000	.021350	.014350	....	....	
8,800	44,000	.024250	.002900	....	....	
9,200	46,000	.027500	.003250	....	....	
9,600	48,000	.031000	.003500	....	....	
10,000	50,000	.036000	.005000	....	....	
10,400	52,000	.041000	.005000	....	....	
10,800	54,000	.047250	.006250	....	....	
11,200	56,000	.053500	.006250	....	....	
11,600	58,000	.061900	.008400	....	....	
12,000	60,000	.070250	.008350	....	....	
12,400	62,000	.0850	.014750	....	....	
12,800	64,000	.1000	.0150	....	....	
13,200	66,000	.1300	.0300	....	....	
13,590	67,950	.2100	.0800	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	67,950
Elastic limit per square inch of original section	do	38,000
Elongation per inch after rupture	inch	.03700
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.215
Reduction in area after rupture, per centum of original section		66.9
Position of rupture		1''.15 from neck
Character of broken surface		fine silky
Elongation of inch sections		''.27, ''.47*

No. 3208.

Marks, $^{3}\text{W}_{\text{B T}_1}$,
Diameter, ″.320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0002	.0001	0.	....	
1,200	15,000	.0004	.0002	0.	....	
1,600	20,000	.0006	.0002	0.	....	
2,000	25,000	.0008	.0002	0.	....	
2,400	30,000	.0010	.0002	.0001	.0001	
2,480	31,000	.0011	.0001	....	....	Elastic limit.
2,560	32,000	.0034	.0023	....	....	
2,640	33,000	.0098	.0064	....	....	
2,720	34,000	.0124	.0026	....	....	
2,800	35,000	.0136	.0012	....	....	
2,880	36,000	.0153	.0017	....	....	
2,960	37,000	.0170	.0017	....	....	
3,040	38,000	.0188	.0018	....	....	
3,120	39,000	.0204	.0016	....	....	
3,200	40,000	.0231	.0027	....	....	
3,360	42,000	.0265	.0034	....	....	
3,520	44,000	.0324	.0059	....	....	
3,680	46,000	.0385	.0061	....	....	
3,840	48,000	.0422	.0037	....	....	
4,000	50,000	.0462	.0040	....	....	
4,160	52,000	.0503	.0041	....	....	
4,320	54,000	.0625	.0122	....	....	
4,480	56,000	.0775	.0150	....	....	
4,640	58,000	.0895	.0120	....	....	
4,800	60,000	.11	.0205	....	....	
4,960	62,000	.14	.03	....	....	
5,080	63,500	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..pounds.. 63,500
Elastic limit per square inch of original section...do.... 31,000
Elongation per inch after rupture...inch.. 0.20
Elongation per inch under strain at elastic limit...do.... .0011
Reduction in diameter at point of rupture..do.... .060
Reduction in area after rupture, per centum of original section.................................. 32.6
Position of rupture..″.05 from middle of stem
Character of broken surface..........................silky, serrated. Opened cracks in surface of stem

No. 3209.

Marks, $\frac{3\ \mathrm{W}_7}{\mathrm{B}\ \mathrm{T}_3}$
Diameter, ″.320.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0003	.0002	0.	....	
1,200	15,000	.0005	.0002	0.	....	
1,600	20,000	.0006	.0001	0.	....	
2,000	25,000	.0008	.0002	0.	....	
2,400	30,000	.0009	.0001	0.	....	
2,480	31,000	.0010	.0001	....	....	
2,560	32,000	.0010	0.	....	....	
2,640	33,000	.0011	.0001	....	....	
2,720	34,000	.0011	0.	....	....	Elastic limit.
2,800	35,000	.0166	.0155	....	....	
2,880	36,000	.0180	.0014	....	....	
2,960	37,000	.0190	.0010	....	....	
3,040	38,000	.0200	.0010	....	....	
3,120	39,000	.0210	.0010	....	....	
3,200	40,000	.0230	.0020	....	....	
3,360	42,000	.0276	.0046	....	....	
3,520	44,000	.0311	.0035	....	....	
3,680	46,000	.0345	.0034	....	....	
3,840	48,000	.0400	.0055	....	....	
4,000	50,000	.0470	.0070	....	....	
4,160	52,000	.0546	.0076	....	....	
4,320	54,000	.0620	.0074	....	....	
4,480	56,000	.0745	.0125	....	....	
4,640	58,000	.0865	.0120	....	....	
4,800	60,000	.0980	.0115	....	....	
4,960	62,000	.115	.017	....	....	
5,120	64,000	.17	.055	....	....	
5,150	64,375	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	64,375
Elastic limit per square inch of original section	do....	34,000
Elongation per inch after rupture	inch..	0.30
Elongation per inch under strain at elastic limit	do....	.0011
Reduction in diameter at point of rupture	do....	.050
Reduction in area after rupture, per centum of original section		28.4
Position of rupture		″.05 from middle of stem
Character of broken surface		silky, serrated. Opened cracks in surface of stem

No. 3210.

Marks, $^{3}_{B}\,^{W_7}_{L_3}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000450	.000150	0.		
4,000	20,000	.000600	.000150	0.		
5,000	25,000	.000750	.000150	0.		
6,000	30,000	.000900	.000150			
6,200	31,000	.000900	0.			
6,400	32,000	.000950	.000050			
6,600	33,000	.001000	.000050			
6,800	34,000	.001000	0.			
7,000	35,000	.001050	.000050			
7,200	36,000	.001150	.000100			
7,400	37,000	.001200	.000050			Elastic limit.
7,600	38,000	.002000	.000800			
7,800	39,000	.018000	.016000			
8,000	40,000	.020000	.002000			
8,200	41,000	.021750	.001750			
8,400	42,000	.023250	.001500			
8,600	43,000	.025100	.001850			
8,800	44,000	.027050	.001950			
9,000	45,000	.029000	.001950			
9,200	46,000	.031000	.002000			
9,400	47,000	.033100	.002100			
9,600	48,000	.035900	.002800			
9,800	49,000	.038150	.002250			
10,000	50,000	.041400	.003250			
10,200	51,000	.044300	.002900			
10,400	52,000	.047000	.002700			
10,600	53,000	.049900	.002900			
10,800	54,000	.053800	.003900			
11,000	55,000	.057500	.003700			
11,200	56,000	.0600	.0025			
11,400	57,000	.0650	.0050			
11,600	58,000	.0700	.0050			
11,800	59,000	.0800	.0100			
12,000	60,000	.0850	.0050			
12,200	61,000	.0950	.0100			
12,400	62,000	.1050	.0100			
12,600	63,000	.1150	.0100			
12,800	64,000	.1400	.0250			
13,000	65,000	.1650	.0250			
13,090	65,450	.2100	.0450			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	65,450
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.3750
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.205
Reduction in area after rupture, per centum of original section		64.6
Position of rupture		1″ from neck
Character of broken surface		fine silky
Elongation of inch sections		″.53, ″.22

No. 3211.

Marks, $\genfrac{}{}{0pt}{}{3\,W_7}{B\,L_4}$
Diameter, ″.506.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.	....	
2,000	10,000	.000300	.000150	0.	....	
3,000	15,000	.000450	.000150	0.	....	
4,000	20,000	.000600	.000150	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000950	.000200	0.	....	
6,200	31,000	.001000	.000050	....	....	
6,400	32,000	.001050	.000050	....	....	
6,600	33,000	.001050	0.	....	....	
6,800	34,000	.001100	.000050	....	....	
7,000	35,000	.001100	0.	....	....	
7,200	36,000	.001150	.000050	....	....	Elastic limit.
7,400	37,000	.016250	.015100	....	....	
7,600	38,000	.017500	.001250	....	....	
7,800	39,000	.018750	.001250	....	....	
8,000	40,000	.020150	.001400	....	....	
8,400	42,000	.023250	.003100	....	....	
8,800	44,000	.027350	.004100	....	....	
9,200	46,000	.030850	.003600	....	....	
9,600	48,000	.036000	.005150	....	....	
10,000	50,000	.041500	.005500	....	....	
10,400	52,000	.047500	.006000	....	....	
10,800	54,000	.052750	.005250	....	....	
11,200	56,000	.062250	.009500	....	....	
11,600	58,000	.0700	.007750	....	....	
12,000	60,000	.0850	.0150	....	....	
12,400	62,000	.1050	.0200	....	....	
12,800	64,000	.1350	.0300	....	....	
13,060	65,300	.2150	.0800	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,300
Elastic limit per square inch of original section	do	36,000
Elongation per inch after rupture	inch	.3700
Elongation per inch under strain at elastic limit	do	.001150
Reduction in diameter at point of rupture	do	.206
Reduction in area after rupture, per centum of original section		64.6
Position of rupture		1″ from neck
Character of broken surface		fine silky
Elongation of inch sections		″.52*, ″.22

INGOT No. 8.—*Lot No.* 3.

No. 3092.

Marks, $\overset{3\,W_{8}}{U\,T}$.
Diameter, ″.321.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	....	....	
800	10,000	.0003	.0002	....	....	
1,200	15,000	.0005	.0002	....	....	
1,600	20,000	.0006	.0001	....	....	
2,000	25,000	.0008	.0002	....	....	
2,400	30,000	.0011	.0003	....	....	Elastic limit.
2,480	31,000	.0014	.0003	....	....	
2,560	32,000	.0016	.0002	....	....	
2,640	33,000	.0020	.0004	....	....	
2,720	34,000	.0027	.0007	....	....	
2,800	35,000	.0146	.0119	....	....	
2,880	36,000	.0171	.0025	....	....	
2,960	37,000	.0190	.0019	....	....	
3,040	38,000	.0200	.0010	....	....	
3,120	39,000	.0211	.0011	....	....	
3,200	40,000	.0231	.0020	....	....	
3,360	42,000	.0240	.0009	....	....	
3,520	44,000	.025	.0010	....	....	
3,680	46,000	.030	.005	....	....	
3,840	48,000	.035	.005	....	....	
4,000	50,000	.04	.005	....	....	
4,160	52,000	.05	.01	....	....	
4,320	54,000	.06	.01	....	....	
4,480	56,000	.07	.01	....	....	
4,640	58,000	.08	.01	....	....	
4,800	60,000	.10	.02	....	....	
4,960	62,000	.115	.015	....	....	
5,120	64,000	.15	.035	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section........................pounds.. 64,000
Elastic limit per square inch of original section........................do.... 30,000
Elongation per inch after rupture........................inch.. 0.19
Elongation per inch under strain at elastic limit........................do.... .0011
Reduction in diameter at point of rupture........................do.... .046
Reduction in area after rupture, per centum of original section........................ 25.8
Position of rupture........................at middle of stem
Character of broken surface........................silky, serrated. Opened cracks in surface of stem

No. 3093.

Marks, $\overset{3\ W.}{U\ T.}$
Diameter, ″.321.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	....	....	
800	10,000	.0002	.0001	....	....	
1,200	15,000	.0003	.0001	....	....	
1,600	20,000	.0005	.0002	....	....	
2,000	25,000	.0007	.0002	....	....	
2,400	30,000	.0009	.0002	....	....	
2,480	31,000	.0009	0.	....	....	
2,560	32,000	.0010	.0001	....	....	
2,640	33,000	.0011	.0001	....	....	Elastic limit.
2,720	34,000	.0015	.0004	....	....	
2,800	35,000	.0020	.0005	....	....	
2,880	36,000	.0078	.0058	....	....	
2,960	37,000	.0122	.0044	....	....	
3,040	38,000	.0180	.0058	....	....	
3,120	39,000	.0210	.0030	....	....	
3,200	40,000	.0227	.0017	....	....	
3,360	42,000	.0250	.0023	....	....	
3,520	44,000	.0281	.0031	....	....	
3,680	46,000	.0330	.0049	....	....	
3,840	48,000	.0375	.0045	....	....	
4,000	50,000	.0420	.0045	....	....	
4,160	52,000	.0515	.0095	....	....	
4,320	54,000	.0600	.0085	....	....	
4,480	56,000	.0700	.0100	....	....	
4,640	58,000	.0817	.0117	....	....	
4,800	60,000	.095	.0133	....	....	
4,960	62,000	.115	.020	....	....	
5,020	62,750	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	62,750
Elastic limit per square inch of original section..do....	33,000
Elongation per inch after rupture..inch..	0.15
Elongation per inch under strain at elastic limit...do....	.0011
Reduction in diameter at point of rupture..do....	.040
Reduction in area after rupture, per centum of original section................................	23
Position of rupture..	″.05 from middle of stem
Character of broken surface..........................	silky, serrated. Opened cracks in surface of stem

No. 3094.

Marks, $\begin{smallmatrix}8\,W_8\\ U\,L_3\end{smallmatrix}$

Diameter, ″.505.

Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Permanent successive set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	6,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000400	.000150	0.	....	
4,000	20,000	.000600	.000200	0.	....	
5,000	25,000	.000750	.000150	0.	....	
6,000	30,000	.000900	.000150	—.000050	—.000050	
6,200	31,000	.000950	.000050	....	....	
6,400	32,000	.001000	.000050	....	....	
6,600	33,000	.001000	0.	....	....	
6,800	34,000	.001050	.000050	....	....	
7,000	35,000	.001100	.000050	....	....	
7,200	36,000	.001100	0.	....	....	
7,400	37,000	.001150	.000050	....	....	
7,600	38,000	.001200	.000050	....	....	
7,800	39,000	.001250	.000050	....	....	Elastic limit.
8,000	40,000	.021500	.020250	....	....	
8,400	42,000	.024500	.003000	....	....	
8,800	44,000	.027500	.003000	....	....	
9,200	46,000	.031600	.004100	....	....	
9,600	48,000	.036700	.005100	....	....	
10,000	50,000	.042000	.005300	....	....	
10,400	52,000	.048750	.006750	....	....	
10,800	54,000	.056000	.007250	....	....	
11,200	56,000	.0637 0	.007750	....	....	
11,600	58,000	.075000	.011250	....	....	
12,000	60,000	.0900	.0150	....	....	
12,400	62,000	.1050	.0150	....	....	
12,800	64,000	.1450	.0400	....	....	
13,000	65,000	.2200	.0750	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 65,000
Elastic limit per square inch of original section .... do.... 39,000
Elongation per inch after rupture .... inch.. 0.375
Elongation per inch under strain at elastic limit .... do.... .001250
Reduction in diameter at point of rupture .... do.... .215
Reduction in area after rupture, per centum of original section 66.9
Position of rupture .... 1″.10 from neck
Character of broken surface .... fine silky
Elongation of inch sections .... ″.22, ″.53

No. 3095.

Marks, $^{3\ \mathrm{W.}}_{\mathrm{U\ L.}}$
Diameter, ''.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200			
2,000	10,000	.000350	.000150			
3,000	15,000	.000500	.000150			
4,000	20,000	.000650	.000150			
5,000	25,000	.000900	.000250			
6,000	30,000	.001050	.000150			
6,200	31,000	.001100	.000050			
6,400	32,000	.001100	0.			
6,600	33,000	.001150	.000050			
6,800	34,000	.001200	.000050			
7,000	35,000	.001200	.0			
7,200	36,000	.001250	.000050			
7,400	37,000	.001300	.000050			
7,600	38,000	.001350	.000050			
7,800	39,000	.001400	.000050			Elastic limit.
8,000	40,000	.019900	.018500			
8,400	42,000	.022500	.002600			
8,800	44,000	.025850	.003350			
9,200	46,000	.029850	.004000			
9,600	48,000	.033750	.003900			
10,000	50,000	.039000	.005250			
10,400	52,000	.044750	.005750			
10,800	54,000	.051000	.006250			
11,200	56,000	.059250	.008250			
11,600	58,000	.0650	.005750			
12,000	60,000	.0850	.0200			
12,400	62,000	.1000	.0150			
12,800	64,000	.1200	.0200			
13,190	65,950	.2100	.0900			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,950
Elastic limit per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.3800
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.215
Reduction in area after rupture, per centum of original section		66.9
Position of rupture		1''.10 from neck
Character of broken surface		fine silky
Elongation of inch sections		''.58*, ''.23

No. 3103.

Marks, $\genfrac{}{}{0pt}{}{\text{s W.}}{\text{B T.}}$
Diameter, ".319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0003	.0002	0.	....	
1,200	15,000	.0005	.0002	0.	....	
1,600	20,000	.0006	.0001	0.	....	
2,000	25,000	.0008	.0002	0.	....	
2,400	30,000	.0009	.0001	0.	....	
2,480	31,000	.0009	0.	....	....	
2,560	32,000	.0010	.0001	....	....	
2,640	33,000	.0011	.0001	....	....	
2,720	34,000	.0011	0.	....	....	
2,800	35,000	.0012	.0001	....	....	Elastic limit.
2,880	36,000	.0071	.0059	....	....	
2,960	37,000	.0158	.0087	....	....	
3,040	38,000	.0172	.0014	....	....	
3,120	39,000	.0213	.0041	....	....	
3,200	40,000	.0230	.0017	....	....	
3,360	42,000	.0250	.0020	....	....	
3,520	44,000	.0306	.0056	....	....	
3,680	46,000	.0362	.0056	....	....	
3,840	48,000	.0400	.0038	....	....	
4,000	50,000	.0480	.0080	....	....	
4,160	52,000	.0575	.0095	....	....	
4,320	54,000	.0650	.0075	....	....	
4,480	56,000	.0795	.0145	....	....	
4,640	58,000	.09	.0105	....	....	
4,800	60,000	.11	.02	....	....	
4,960	62,000	.13	.02	....	....	
4,980	62,250	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	62,250
Elastic limit per square inch of original section	do	35,000
Elongation per inch after rupture	inch	0.19
Elongation per inch under strain at elastic limit	do	.0012
Reduction in diameter at point of rupture	do	.044
Reduction in area after rupture, per centum of original section		25.8
Position of rupture		".35 from neck
Character of broken surface		silky, serrated. Opened cracks in surface of stem

No. 3104.

Marks, $^{3}W_{3}$ / B T_3
Diameter, ″.319.
Sectional area, .08 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
80	1,000	0.	0.	0.	0.	Initial load.
400	5,000	.0001	.0001	0.	....	
800	10,000	.0003	.0002	0.	....	
1,200	15,000	.0005	.0002	0.	....	
1,600	20,000	.0006	.0001	0.	....	
2,000	25,000	.0007	.0001	0.	....	
2,400	30,000	.0009	.0002	0.	....	
2,480	31,000	.0009	0.	....	....	
2,560	32,000	.0010	.0001	....	....	
2,640	33,000	.0010	0.	....	....	
2,720	34,000	.0011	.0001	....	....	
2,800	35,000	.0011	0.	....	....	
2,880	36,000	.0012	.0001	....	....	Elastic limit.
2,960	37,000	.0025	.0013	....	....	
3,040	38,000	.0208	.0183	....	....	
3,120	39,000	.0225	.0017	....	....	
3,200	40,000	.0245	.0020	....	....	
3,360	42,000	.0260	.0015	....	....	
3,520	44,000	.0325	.0065	....	....	
3,680	46,000	.0370	.0045	....	....	
3,840	48,000	.0415	.0045	....	....	
4,000	50,000	.0490	.0075	....	....	
4,160	52,000	.0580	.0090	....	....	
4,320	54,000	.0653	.0073	....	....	
4,480	56,000	.0780	.0127	....	....	
4,640	58,000	.095	.017	....	....	
4,800	60,000	.115	.020	....	....	
4,960	62,000	.15	.035	....	....	
5,020	62,750	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	62,750
Elastic limit per square inch of original section	do....	36,000
Elongation per inch after rupture	inch..	0.21
Elongation per inch under strain at elastic limit	do....	.0012
Reduction in diameter at point of rupture	do....	.044
Reduction in area after rupture, per centum of original section		25.8
Position of rupture		at middle of stem
Character of broken surface		silky, serrated. Opened cracks in surface of stem

No. 3105.

Marks, $\substack{3\ W_s \\ B\ L_s}$
Diameter, ".505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000150	.000150	0.		
2,000	10,000	.000300	.000150	0.		
3,000	15,000	.000450	.000150	0.		
4,000	20,000	.000650	.000200	0.		
5,000	25,000	.000850	.000200	0.		
6,000	30,000	.001000	.000150	0.		
6,200	31,000	.001000	0.			
6,400	32,000	.001050	.000050			
6,600	33,000	.001100	.000050			
6,800	34,000	.001150	.000050			
7,000	35,000	.001200	.000050			
7,200	36,000	.001250	.000050			
7,400	37,000	.001300	.000050			
7,600	38,000	.001350	.000050			
7,800	39,000	.001400	.000050			
8,000	40,000	.001450	.000050			**Elastic limit.**
8,200	41,000	.009250	.007800			
8,400	42,000	.021800	.012550			
8,800	44,000	.023900	.002100			
9,200	46,000	.027750	.003850			
9,600	48,000	.032250	.004500			
10,000	50,000	.037250	.005000			
10,400	52,000	.043000	.005750			
10,800	54,000	.048500	.005500			
11,200	56,000	.056000	.007500			
11,600	58,000	.065750	.009750			
12,000	60,000	.076000	.010250			
12,400	62,000	.0900	.0140			
12,800	64,000	.1100	.0200			
13,200	66,000	.1450	.0350			
13,410	67,050	.1900	.0450			**Tensile strength.**

General summary.

Tensile strength per square inch of original section	**pounds**	**67,050**
Elastic limit per square inch of original section	**do**	**40,000**
Elongation per inch after rupture	**inch**	**.03500**
Elongation per inch under strain at elastic limit	**do**	**.001450**
Reduction in diameter at point of rupture	**do**	**.195**
Reduction in area after rupture, per centum of original section		**62.2**
Position of rupture		**1".25 from neck**
Character of broken surface		**fine silky**
Elongation of inch sections		**".28, ".42**

No. 3106.

Marks, $\genfrac{}{}{0pt}{}{3\,W_3}{B\,L_4}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000100	.000100	0.	....	
2,000	10,000	.000250	.000150	0.	....	
3,000	15,000	.000450	.000200	0.	....	
4,000	20,000	.000700	.000250	0.	....	
5,000	25,000	.000850	.000150	0.	....	
6,000	30,000	.001000	.000150	0.	....	
6,200	31,000	.001050	.000050	....	....	
6,400	32,000	.001100	.000050	....	....	
6,600	33,000	.001150	.000050	....	....	
6,800	34,000	.001200	.000050	....	....	
7,000	35,000	.001250	.000050	....	....	
7,200	36,000	.001300	.000050	....	....	
7,400	37,000	.001350	.000050	....	....	Elastic limit.
7,600	38,000	.004750	.003400	....	....	
7,800	39,000	.013250	.008500	....	....	
8,000	40,000	.018000	.004750	....	....	
8,400	42,000	.023750	.005750	....	....	
8,800	44,000	.028000	.004250	....	....	
9,200	46,000	.032000	.004000	....	....	
9,600	48,000	.035750	.003750	....	....	
10,000	50,000	.041250	.005500	....	....	
10,400	52,000	.047050	.005200	....	....	
10,800	54,000	.054500	.007450	....	....	
11,200	56,000	.062000	.007500	....	....	
11,600	58,000	.074500	.012500	....	....	
12,000	60,000	.0900	.0155	....	....	
12,400	62,000	.1050	.0150	....	....	
12,800	64,000	.1400	.0350	....	....	
13,080	65,400	.2150	.0750	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	65,400
Elastic limit per square inch of original section	do	37,000
Elongation per inch after rupture	inch	0.3650
Elongation per inch under strain at elastic limit	do	.001350
Reduction in diameter at point of rupture	do	.200
Reduction in area after rupture, per centum of original section		64.6
Position of rupture		1″.10 from neck
Character of broken surface		fine silky
Elongation of inch sections		″.25, ″.48

TABULATION OF SPECIMENS FROM WIRE BILLETS.—LOT NO. 3.

No. of test.	No. of ingot.	Billet.	Position of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Remarks.
				Pounds.	*Pounds.*	*Per cent.*	*Per cent.*		
3020	1	Top	Diagonal	30,000	64,500	35.0	52.5	Silky	
3021	1	do	do	29,000	64,500	34.0	47.5	do	
3022	1	do	Longitudinal	30,000	66,100	36.5	59.8	Fine silky	
3023	1	do	do	30,000	66,850	36.5	59.8	do	
3024	1	Bottom	Diagonal	33,000	64,000	27.0	28.4	Silky, serrated	New billet.
3025	1	do	do	31,000	64,890	34.0	38.6	do	Do.
3026	1	do	Longitudinal	33,000	64,150	38.5	62.2	Fine silky	Do.
3027	1	do	do	33,000	65,950	36.0	62.2	do	Do.
2901	2	Top	Diagonal	37,000	68,250	28.0	23.0	Granular, 50 per cent.; flaky, 50 per cent	
2902	2	do	do	39,000	68,250	29.0	43.5	Flaky, serrated	
2903	2	do	Longitudinal	40,000	69,200	36.0	62.2	Silky	
2904	2	do	do	41,000	68,600	36.0	62.2	do	
3028	2	Bottom	Diagonal	33,000	65,250	31.0	38.6	Silky, serrated	
3029	2	do	do	34,000	65,125	28.0	33.6	do	
3030	2	do	Longitudinal	35,000	65,600	37.0	62.2	Fine silky	
3031	2	do	do	34,000	66,000	35.5	59.8	do	
2932	3	Top	Dia.onal	35,000	61,070	17.0	26.1	Dull silky, serrated	
2933	3	do	do	31,000	63,500	37.0	50.2	Silky, serrated	
2934	3	do	Longitudinal	36,000	65,850	36.5	66.9	Fine silky	
2935	3	do	do	35,000	63,210	39.0	69.1	do	
3032	3	Bottom	Diagonal	35,000	64,500	37.0	43.7	Silky, serrated	
3033	3	do	do	36,000	66,500	35.0	38.6	do	
3034	3	do	Longitudinal	33,000	64,650	36.5	66.9	Fine silky	
3035	3	do	do	35,000	66,400	36.5	64.6	do	
3036	4	Top	Diagonal	32,000	64,750	19.0	28.4	Silky, serrated	
3037	4	do	do	31,000	65,750	20.0	28.4	do	
3038	4	do	Longitudinal	35,000	67,300	36.5	64.6	Fine silky	
3039	4	do	do	36,000	66,800	36.0	62.2	do	
3040	4	Bottom	Diagonal	36,000	65,000	37.0	52.5	Silky, serrated	
3041	4	do	do	35,000	64,500	34.0	47.5	do	
3042	4	do	Longitudinal	38,000	64,100	38.5	66.9	Fine silky	
3043	4	do	do	34,000	64,450	39.0	66.9	do	
3044	5	Top	Diagonal	34,000	65,000	17.0	28.4	Silky, serrated	
3045	5	do	do	33,000	63,875	30.0	33.6	do	
3046	5	do	Longitudinal	31,000	66,850	26.0	62.2	Fine silky	
3047	5	do	do	35,000	67,750	36.5	64.6	do	

3048	5	Bottom	Diagonal	33,000	64,125	32.0	38.6	Silky, serrated
3049	5	....do	......do	30,000	65,500	32.0	38.6	......do
3050	5	....do	Longitudinal	34,000	65,050	36.0	62.2	Fine silky
3051	5	....do	......do	34,000	64.550	36.0	63.2	......do
3100	6	Top	Diagonal	41,000	64,500	32.0	52.5	Silky, serrated
3101	6	.. do	......do	38,000	65,250	32.6	43.5	..... do
3102	6	. do	Longitudinal	38,000	65,850	37.5	66.9	Fine silky
3096	6	Bottom	Diagonal	29,000	65,125	28.0	28.4	Silky, serrated
3097	6	....do	......do	31,000	64,875	31.0	28.4	......do
3098	6	....do	Longitudinal	36,000	65,450	38.5	66.9	Fine silky
3099	6	....do	......do	38,000	65,900	38.0	66.9	......do
3212	7	Top	Diagonal	36,000	64,375	22.0	28.4	Silky, serrated
3213	7	.. do	......do	39,000	65,125	22.0	28.4	......do
3214	7	.. do	Longitudinal	38,000	66,600	37.0	64.6	Fine silky
3215	7	....do	......do	38,000	67,950	37.0	66.9	......do
3208	7	Bottom	Diagonal	31,000	63,500	29.0	33.6	Silky, serrated
3209	7	....do	......do	34,000	64,875	30.0	28.4	......do
3210	7	....do	Longitudinal	37,000	65,450	37.5	64.6	Fine silky
3211	7	....do	......do	36,000	65,300	37.0	64.6	......do
3092	8	Top	Diagonal	30,000	64,000	19.0	25.8	Silky, serrated
3093	8	....do	......do	33,000	62,750	15.0	23.0	......do
3094	8	....do	Longitudinal	39,000	65,000	37.5	66.9	Fine silky
3095	8	....do	......do	39,000	65,950	38.0	66.9	......do
3103	8	Bottom	Radial	35,000	62,250	19.0	25.8	Silky, serrated
3104	8	... do	......do	36,000	62,750	21.0	25.8	......do
3105	8	....do	Longitudinal	40,000	67,050	35.0	62.2	Fine silky
3106	8	... do	......do	37,000	65,400	36.5	64.6	......do

The elongations of the diagonal specimens were measured in 1 inch, the longitudinal ones in 2 inches.

INITIAL STRAINS

IN SOME

TEMPERED AND ANNEALED STEEL CYLINDERS.

INITIAL STRAINS IN SOME TEMPERED AND ANNEALED STEEL CYLINDERS.

The cylinders here experimented upon were sections cut from the muzzle ends of tubes Nos. 7, 8, and 21 for 3″.2 rifles, forwarded by Lieut. F. E. Hobbs, Ordnance Department, U. S. Army, from the Midvale Steel Works, Philadelphia, Pa., where the steel was manufactured.

The cylinder from tube No. 7 had been re-tempered but not re-annealed, whereas cylinders Nos. 8 and 21 had been oil-tempered and subsequently annealed.

When received for testing their rough-turned dimensions were as follows:

	Length.	Diameter of bore.	Diameter of exterior.
	Inches.	*Inches.*	*Inches.*
No. 7.............	3.875	2.77	6.25
No. 8.............	3.83	2.75	6.25
No. 21...........	4.125	2.75	6.28

From these cylinders were taken a number of concentric rings, the diameters of which were measured on their exposed ends while in the cylinders, and again after they were detached, the difference in diameters being the strains which they had been subjected to, and thus indicate the initial stresses of the metal.

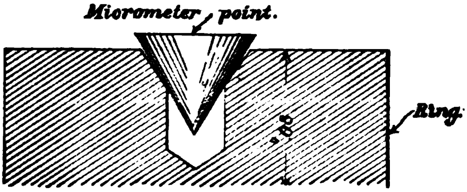
The method of measuring adopted and the manner of removing the rings from the cylinders may be described as follows:

The cylinders were first finished in the lathe, the least amount of metal being turned off consistent with securing good surfaces. Light circular lines were scored at the middle of the thickness of each concentric ring on their exposed ends.

At the intersection of four diameters, making equal angles with each other, with the circular lines, there were established datum points between which micrometer measurements were taken.

Extra precautions were taken in preparing these datum points or conical holes to avoid disturbing the state of the metal, and instead of forming them by means of a center-punch, a method admissible when dealing with larger masses of metal, it was thought best to make these holes by drilling small holes ″.035 diameter, and reaming them with a countersink to an angle of 65 degrees.

The conical points of the micrometer which entered these holes when taking measurements were made with a taper of 60 degrees, thus securing contact with the rings at a short distance below the surface and at points likely to be out of reach of accidental injury.



Enlarged view.

The end rings from cylinders Nos. 7 and 8 were cut off in the lathe while on an arbor. The middle section of No. 7 was held in a chuck for the same purpose.

Cylinder No. 21 was first cut apart at the middle of its length, the halves turned down on the outside diameters and then bored to 3″.2 diameter, after which the rings were detached when held in a chuck.

The detached rings were each ″.23 thick, their lengths about 1″ each (except when otherwise stated), as shown by the accompanying drawings.

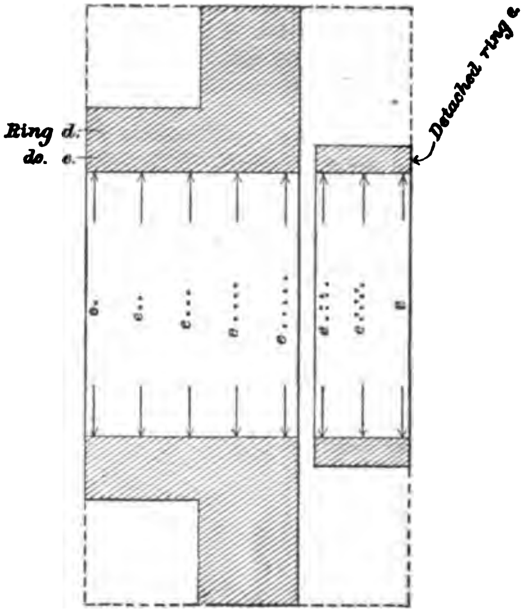
DESCRIPTION OF THE BEHAVIOR OF THE RINGS FROM EACH CYLINDER.

CYLINDER NO. 7.

The rings from end *a–e* were first detached, all of which expanded in so doing, showing initial compression strains and the greatest intensity at the corner rings.

When rings *a*. *b*. and *c*. had been removed from the opposite end, leaving rings *d*. and *e*. attached to the middle section of the cylinder, measurements were taken at the bore along the line of diameter No. 1 in order to locate the opposing tensile strains, as all the rings thus far removed had been under initial compressive strains; also at this time the surface diameters of rings *d*. and *e*. were measured.

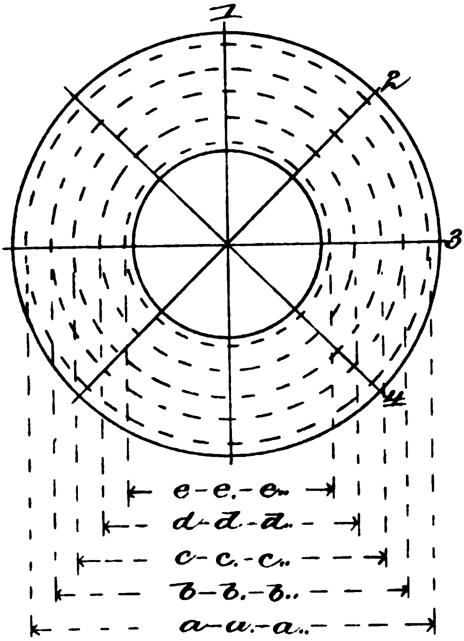
The condition of the cylinder when these measurements were taken is here shown:



Diameters of bore.

		Inches.
	e.	2.8667
	e..	2.8628
	e...	2.8604
	e....	2.8596
	e.....	2.8563
Detached ring	*e*.·.·.	2.8578
	e.·.·.·.	2.8575
	e	2.8634

Cylinder No. 7



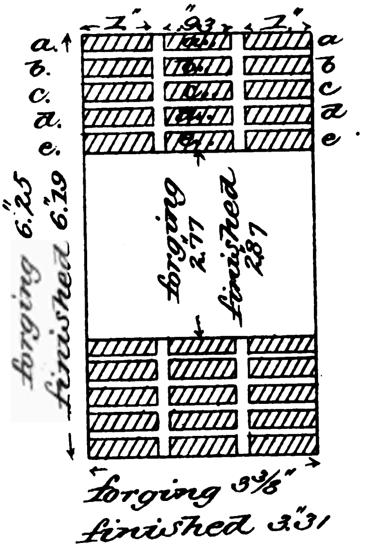
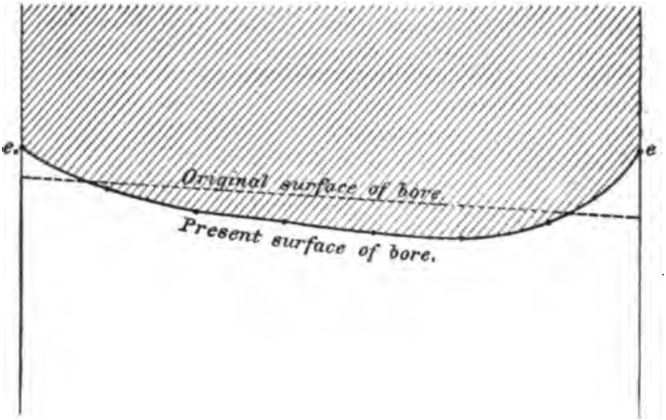


Diagram showing changes at bore.



Horizontal scale full size; vertical scale magnified fifty times.

Measurements of bore with all the rings detached from both ends.

	Inches.
Detached ring *e*.	2.8683 2.8646
Middle section of cylinder	2.8585 2.8686 2.8586
Detached ring *e*	2.8578 2.8575 2.8634

The above measurements of the bore, and the diagram constructed therefrom, will be regarded only as showing close approximations of the changes in diameters.

It was not intended in this manner to show the amount of initial strains, but merely point out the location of the tensile strains.

Surface measurements on rings *d*. and *e*. were taken at the intermediate stage when they remained attached to the middle section of the cylinder, as shown in the foregoing sketch, and were as follows:

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
d.	3.8282	3.8291	3.8365	3.8359	3.8324
e.	3.1227	3.1201	3.1204	3.1211	3.1210

The mean initial, intermediate, and final measurements of these rings were—

[In inches.]

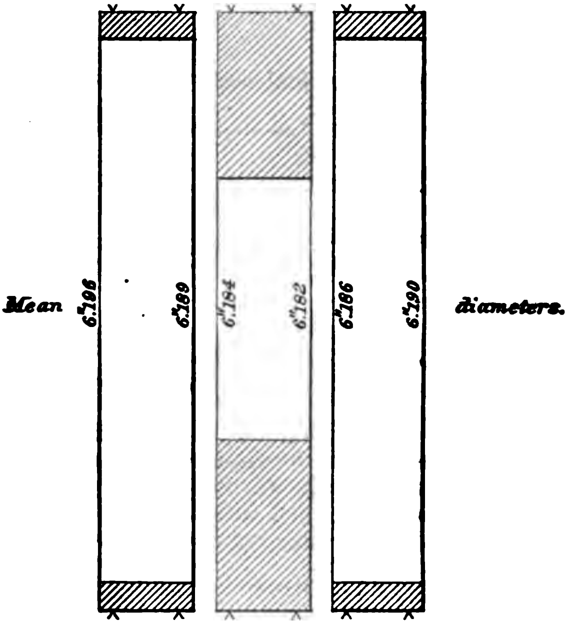
Measurements.	Ring *d*.	Difference.	Ring *e*.	Difference.
Initial	3.8280	....	3.1169	....
Intermediate	3.8324	+.0044	3.1211	+.0058
Final	3.8310	−.0014	3.1218	+.0007

From these measurements we observe that the outer ends of these two rings were expanded at the intermediate stage ″.0044 and ″.0058 in diameter, which taken in connection with the final diameters show that it made very little difference at the outside ends, after the superimposed rings had been removed, whether the remaining ones were attached or not to the middle section.

Upon final removal ring *e*. expanded the additional amount of ″.0007, whereas ring *d*. contracted ″.0014, the initial strains in ring *e*. being so much greater than those in ring *d*. as to increase the diameter of the latter ring when the two were in combination.

The difference in expansion of the two rings at the intermediate stage—the smaller ring showing the greater expansion—shows the presence of intense local strains, which will be referred to later on.

The conicalness of the inside rings is exemplified in the outside rings, as the following sketch giving the mean diameters will show:



From this it appears that the compressive strains reach their maximum at or near the original surface of the cylinder.

In order to ascertain whether the changes in surface diameters represented fairly the strains at the surface, or the mean change for their respective length of rings, two rings, *b* and *c*, were cut down from 1″ long to ″.25 long after their removal from the cylinder; which when measured showed as follows:

Measurements of rings b and c, ¼ inch long.

[In inches.]

Rings.	Diameters.				Means.	Means when 1″ long.
	1	2	3	4		
b	5.2466	5.2439½	5.2435	5.2521	5.2465	5.2459
c	4.5420½	5.2424	4.5358	4.5412½	4.5404	4.5408

Showing a further expansion of the metal in the short rings of ″.0006 and ″.0001, respectively.

These amounts not being large, the changes in surface diameters of the end rings indicate but little below the maximum amount of initial strains.

The strains measured on the rings from the middle section are those which remained after removing the end rings; they are thought, however, to give very close indication of the strains which may prevail in the middle section of a longer tube.

Following the tables of diameters as measured are tables showing the initial strains which are the differences between the original and final diameters; here are also given the computed stresses, corresponding to the strains, assuming for the purpose of computation a modulus of elasticity of 30,000,000 pounds per square inch.

Applying the same modulus of elasticity to the tempered and the annealed metal is justified by previous experiments on round bars under tensile stresses.

It appears from the results obtained that this cylinder had its entire surface metal, exterior, bore, and ends, under an initial state of compression, and the interior of the mass in a state of tension.

The maximum stresses found being 47,161 pounds per square inch compression and 938 pounds per square inch tension, the latter stress not representing the maximum amount which was in the cylinder when entire, the inaccessibility of the tensile metal at the time preventing that value being ascertained.

After the completion of the foregoing experiments some additional observations were made upon ring *a*.

It was subjected to the treatment mentioned below and re-measured after each step, the column of differences showing the change in diameters from the mean final diameter when taken from the cylinder.

Ring a.

[Heated cherry red and cooled in open air.]

[In inches.]

Ring.	Diameters.				Mean.	Difference.
	1	2	3	4		
a.	5.9506	5.9439	5.9649	5.9614	5.9552	+.0024

[Heated cherry red and hardened in brine at temperature of 40° Fahr.]

a.	5.9806	5.9741	6.0195	6.0099	5.9960	+.0432

[Heated cherry red and annealed by cooling in ashes.]

a.	5.9745	5.9711	6.0114	5.9971	5.9885	+.0357

When hardened in brine the metal could not be "touched" with a file, and in this state would, no doubt, be found to possess a very high elastic limit under compression. Computations are not entered into, however, to show what stress would be required to reduce its diameter the amount given in the column of differences, because it depends upon further experiments to show to what extent the state of the metal can be changed when it is in combination with a large mass; the above figures not necessarily indicating that amount.

It is believed, however, that local strains of very great intensity do at times exist, accounting for the ellipticity of some of the detached rings and the differences in the same diameters measured on adjacent rings.

Indeed, from other examples, it seems quite probable that initial strains may culminate in the fracture of the metal.

It may not be irrelevant to remark at this time that recent specific gravity determinations show that changes in form, whether temporary or permanent sets, occasioned by the application of stresses, are accompanied by changes in density, and that the same is true of metals subjected to the processes of hardening and annealing by the application of heat.

Previous experiments tend to show that variations in density and initial strains co exist in the same piece of metal and may yet be established as correlative functions.

CYLINDER No. 8.

This cylinder was tempered and subsequently annealed.

The strains found were of small magnitude compared with those of No. 7. When the strains were so low as one ten-thousandth of an inch it may be said that practically the metal is in a neutral attitude.

Those rings taken from the ends of the cylinder show for the most part a retention of compressive strains, diminishing in amount as we pass from the external rings towards the bore.

The corresponding tensile strains required to balance these compressive strains are necessarily located in the middle section of the length of the cylinder, and which would be released upon the removal of the end rings.

After completing the experiments with the end rings the middle section was cut into two slices, and each re-treated at Watertown Arsenal.

Slice *a*..–*e*.. was heated low cherry red and quenched from the interior with oil.

Slice *a*...–*e*... was heated low cherry red and quenched from the interior with water.

The inside ring *e*... detached; then the remaining rings in the slice were heated bright red and cooled as before, with water from the interior.

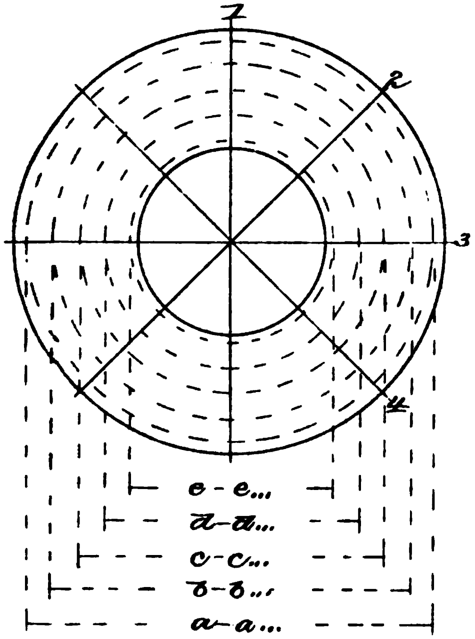
Slice *a*..–*e*.. was heated in the gas flame of a number of Bunsen's burners; when hot was placed between whitewood cushions, the lower one of which rested on supports; the upper one was weighted to keep them in close contact with the slice.

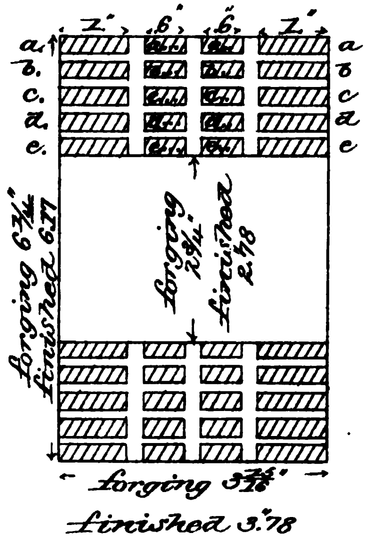
The perforated nozzle of the oil pipe was lowered into position, the perforations coming opposite the middle of the length of the slice; then the slice was cooled by the oil under pressure being forced against the bore.

Slice *a*...–*e*... was treated in a similar manner, using water as the quenching fluid.

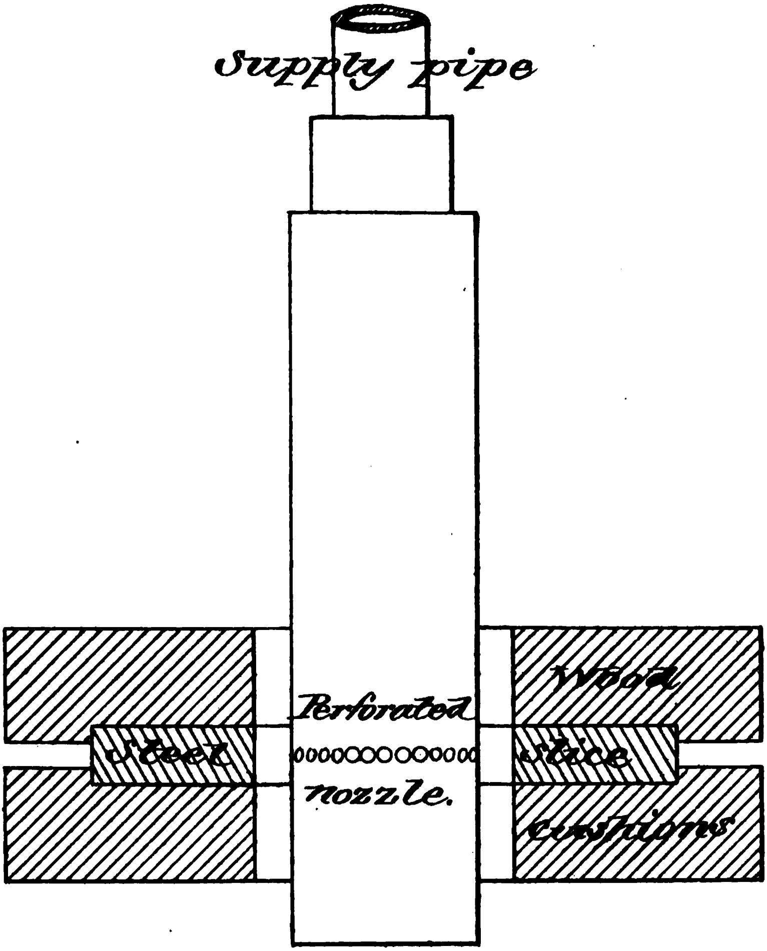
The first heating was done by gas, the second over an anthracite fire. During the first cooling some of the water reached the end surface of the slice. During the second cooling from a bright red the water was confined to the surface of the bore; the whitewood cushions on this occasion were lined with asbestos.

Cylinder No. 8





Fixture employed in cooling slices a..-e.. and a...-e... cylinder No. 8, from the bore.



Before heating these slices the datum points were established and surface diameters of the rings measured. After heating and cooling, the diameters were again measured.

The following tables show the changes which occurred:

Slice a . .–e . .

[Contraction in diameters due to heating low cherry red and cooling with oil from the bore.]

[In inches.]

Ring.	Diameters. 1	2	3	4	Means.
a . .	.0017	.0018	.0009	.0011	.0014
b . .	.0023	.0016	.0010	.0014	.0016
c . .	.0022	.0022	.0012	.0015	.0018
d . .	.0024	.0021	.0013	.0017	.0019
e . .	.0026	.0021	.0012	.0018	.0019
Means.	.0022	.0020	.0011	.0015	.0017

Slice a . . .–e . . .

[Contraction in diameters due to heating low cherry red and cooling with water from the bore.]

[In inches.]

Ring.	Diameters. 1	2	3	4	Means.
a . . .	.0027	.0023	.0015	.0019	.0021
b . . .	.0024	.0024	.0020	.0021	.0022
c . . .	.0021	.0020	.0015	.0016	.0018
d . . .	.0025	.0026	.0019	.0021	.0023
e . . .	.0030	.0031	.0025	.0023	.0027
Means.	.0025	.0025	.0019	.0020	.0022

Slice a . . .–d . . .

[Contraction in diameters due to heating bright red and cooling with water from the bore.]

[In inches.]

Ring.	Diameters. 1	2	3	4	Means.
a . . .	+.0051	+.0059	.0162	.0125	.0044
b . . .	+.0015	+.0036	.0191	.0158	.0075
c . . .	.0013	+.0006	.0230	.0193	.0106
d . . .	.0029	.0019	+.0006	.0210	.0063
Means..	+.0006	+.0020	.0144	.0171	.0072

Plus signs indicate expansion.

These figures indicate the movement of the metal during the process of heating and cooling, and do not signify what strains result from the process.

In each slice there was a mean contraction in diameters, although in the slice *a* . . . – *d* . . . several diameters expanded.

The manner in which the datum points were found to have floated about the surface of the highly heated slice *a*... – *d*... is remarkable.

It will be further noted that this slice, which contracted ″.0072 in diameter as a whole, was heated to a higher temperature than was ring *a*. of cylinder No. 7, which upon total immersion in the quenching fluid (brine at 40° Fahr.) increased in diameter ″.0408.

It is observed that initial compression strains at the bore were obtained while the slices as a whole contracted in diameter.

The high heat was applied to slice *a*... – *d*... with a view of obtaining if possible an expansion in diameters similar to the behavior of detached ring *a*., cylinder No. 7, and then ascertaining the effect on the initial strains. Such expansion of diameters, however, was not accomplished.

Further experiments in this direction would be of interest; as, for instance, the quenching of rings of different thicknesses; cooling from one surface in order that different amounts of heat should pass through that surface; and whereas in these experiments oil and water have been used as quenching fluids, it might be desirable to ascertain the maximum effects produced by cooling with air, inasmuch as in the reverse process of annealing it is necessary to exclude cold air from access to the metal.

REMARKS ON MEASUREMENTS TAKEN AT INTERMEDIATE STAGES.

Slices a.. – d.. and a... – d...

The rings from these slices were detached one by one, commencing at the bore.

After the removal of each ring, that and the remaining ones in the slice were measured. The tables show the strains which were liberated at each of these successive stages.

When rings *a*.. and *b*.. were detached from each other their changes in diameters took place irregularly, which accounts for the apparent final expansion of each of ″.0002 and ″.0005, respectively.

When ring *e*... was detached from its slice, following the process of heating to a low cherry red, and cooling from the bore with water at 50° Fahr., the strains liberated were:

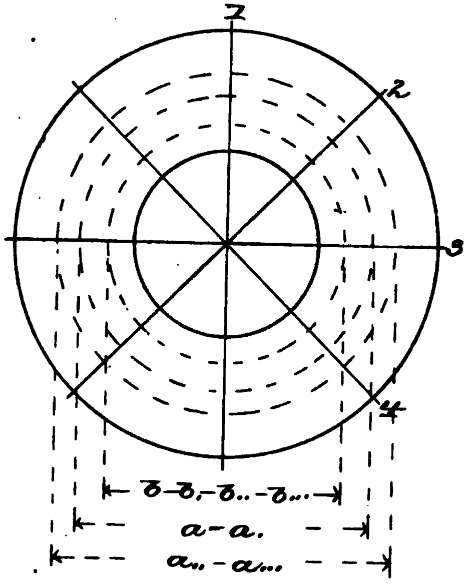
[In inches.]

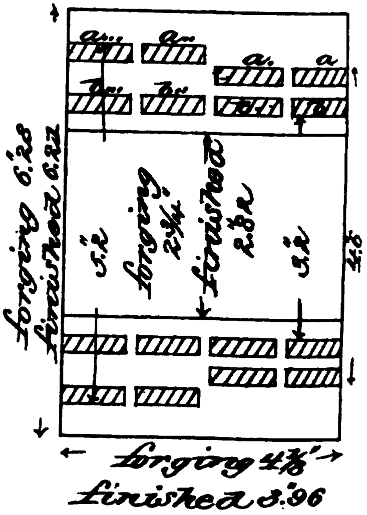
Rings.	Strains.	
	Tension.	Compression.
a...	.0012	....
b...	.0014	....
c...	.0015	....
d...	.0019	....
e...	....	.0050

Which corresponds in ring *e*... to a compressive stress of 49,580 pounds per square inch.

The stresses developed in the remaining rings of this slice by quenching from the higher temperatures of bright red were the maximum observed in the series, the range of stresses extending from 50,814 pounds per square inch tension to 59,060 pounds per square inch compression; a total range of 109,874 pounds per square inch in the same piece of metal

Cylinder No. 21





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The compression stress exceeded the primitive elastic limit of the metal. Even this is not all, for the observed stresses are the means for their respective rings, the rings which were cut apart radially showing additional strains not released until then.

A special experiment with ring *e*.. supplied further data in this direction.

After it was detached from the slice and measured, it was turned down in the lathe from the outside, reducing its thickness, while in the mean time the bore expanded additional amounts, as follows:

[In inches.]

Condition.	Thickness.	Diameter of bore.	Strains released.	
			Successive.	Total.
In slice	.25	2.7800	0.	0.
Detached	.25	2.7835	.0035	.0035
Turned down	.20	2.7839	.0004	.0039
Do	.15	2.7843	.0004	.0043
Do	.10	2.7845	.0002	.0045
Do	.05	2.7847	.0002	.0047

The stress corresponding to this strain of ".0047 at the surface of the bore is 50,720 pounds per square inch against 34,669 pounds per square inch displayed by the entire ring.

The ring was finally turned down to ".025 thickness and then cut apart radially; whereupon the ends opened ".147, thus showing a difference of intensity of stresses as they existed in this thin ring.

CYLINDER No. 21.

Tempered and annealed.

The rings of this cylinder were measured at three stages, namely: (1) when the cylinder had been turned to the finished diameters as a whole; (2) when turned to the diameters of the naked tube of a 3".2 gun; (3) after the rings were detached.

The inside rings *a*., *b*., *a*.., and *b*.. were made accessible in the first instance by cutting the cylinder into halves at the middle of its length.

The initial strains in these rings are of small magnitude when compared with those of cylinder No. 7; the maximum strains representing a compressive stress of 2,075 pounds per square inch in ring *a*, in passing from its condition in the finished cylinder to the reduced dimensions of the naked tube, which amount is increased to 3,457 pounds per square inch when detached.

The differences of the two tables of strains and stresses show the comparative state of the metal in the naked tube and in detached rings, and are as follows:

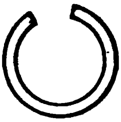
Rings.	Initial strains.		Initial stresses per square inch.	
	Tension.	Compression.	Tension.	Compression.
	Inch.	*Inch.*	*Pounds.*	*Pounds.*
a	....	.0002	....	1,382
b	.0001	....	873	....
a .	.0001	....	688	....
b .	.0001	....	861	....
a . .	....	.0001	....	607
b . .	....	.0001	....	868
a . . .	....	.0001	....	609
b . . .	.0001	....	871	....

From which is shown that the initial strains in the cylinder when turned to the diameters of the naked tube are almost extinct.

A general observation applicable to the three cylinders is the apparent unsymmetrical arrangement of the initial strains in their masses.

In cylinder No. 7 the stresses of greatest intensity were at the corners and exposed surfaces, the retrogression in intensity occurring very rapidly when departing from those surfaces.

This fact is strikingly illustrated by the outside ring *a*, from which a sector 2¼″ long was cut. The opening then closed a distance of ″.19,



thus showing this ring, ″.23 thick, contained within itself, after detachment from the cylinder, tensile and compressive stresses of great magnitude and intensity.

A similar sector 1″.7 long was cut from ring *c* . ., cylinder No. 7.

Very little change was experienced, the ends of the ring closing only about one-thousandth of an inch.

CYLINDER No. 7.

FINISHED DIMENSIONS.

Length	inches	3.31
Inside diameter	do	2.87
Outside diameter	do	6.19

[In inches.]

Rings.	Diameters. 1	2	3	4	Means.
a	5.9455	5.9463	5.9474	5.9475	5.9467
b	5.2407½	5.2425	5.2402	5.2432½	5.2417
c	4.5393	4.5403	4.5342	4.5382	4.5380
d	3.8244	3.8268	3.8257½	3.8250	3.8255
e	3.1126	3.1210	3.1189	3.1180	3.1176
a.	5.9472	5.9426	5.9469	5.9433	5.9450
b.	5.2347	5.2398	5.2392	5.2395	5.2383
c.	4.5353	4.5387	4.5361	4.5354½	4.5369
d.	3.8237	3.8252	3.8322	3.8311	3.8280
e.	3.1186	3.1166	3.1161½	3.1166	3.1170

RINGS DETACHED.

Rings.	1	2	3	4	Means.
a	5.9563½	5.9540	5.9556½	5.9573	5.9558
b	5.2453	5.2453	5.2441	5.2491	5.2459
c	4.5416	4.5425	4.5365	4.5406	4.5403
d	3.8263	3.8283	3.8273	3.8268	3.8272
e	3.1161	3.1247½	3.1225	3.1221	3.1214
a.	5.9529	5.9475	5.9569	5.9587	5.9528
b.	5.2396½	5.2432	5.2443	5.2459½	5.2433
c.	4.5387	4.5416	4.5410	4.5384	4.5399
d.	3.8269	3.8280	3.8351	3.8340	3.8310
e.	3.1240	3.1208	3.1203	3.1223	3.1219

MIDDLE SECTION OF CYLINDER.

Rings.	1	2	3	4	Means.
a..	5.9334	5.9304	5.9366	5.9332	5.9334
b..	5.2410	5.2414	5.2369	5.2349	5.2386
c..	4.5328	4.5333	4.5313	4.5314	4.5322
d..	3.8380	3.8368	3.8378	3.8362	3.8372
e..	3.1299	3.1279	3.1266	3.1347	3.1303

MEASUREMENTS OF DETACHED RINGS.

Rings.	1	2	3	4	Means.
a..	5.9404	5.9340	5.9379	5.9358	5.9370
b..	5.2414½	5.2417	5.2374	5.2354	5.2390
c..	4.5321	4.5325	4.5297	4.5302	4.5311
d..	3.8366	3.8350	3.8369	3.8355	3.8360
e..	3.1298	3.1292	3.1303	3.1362	3.1314

COMPUTED STRESSES.

Rings.	Mean diameters. Before cutting up.	After cutting up.	Initial strains.	Initial stresses per square inch. Tension.	Compression.
	Inches.	*Inches.*	*Inches.*	*Pounds.*	*Pounds.*
a	5.9467	5.9558	+.0091	....	45,907
b	5.2417	5.2459	+.0042	....	12,038
c	4.5380	4.5403	+.0023	....	15,204
d	3.8255	3.8272	+.0017	....	13,331
e	3.1176	3.1214	+.0038	....	36,566
a.	5.9450	5.9528	+.0078	....	39,361
b.	5.2383	5.2433	+.0050	....	28,635
c.	4.5369	4.5399	+.0030	....	19,837
d.	3.8280	3.8310	+.0030	....	23,510
e.	3.1170	3.1219	+.0049	....	47,161

MIDDLE SECTION OF CYLINDER.

Rings.	Before cutting up.	After cutting up.	Initial strains.	Tension.	Compression.
a..	5.9334	5.9370	+.0036	....	18,202
b..	5.2386	5.2390	+.0014	....	2,291
c..	4.5322	4.5311	−.0011	728	....
d..	3.8372	3.8360	−.0012	938	....
e..	3.1303	3.1314	+.0011	....	1,054

CYLINDER NO. 8.

FINISHED DIMENSIONS.

Length	**inches.. 1.7**
Inside diameter	**do.... 2.7**
Outside diameter, end *a–e*	**do.... 6.2**
Outside diameter, end *a.–e.*	**do.... 6.1**

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a	5.9569	5.9548½	5.9565	5.9579½	5.9565
b	5.2269	5.2264	5.2267	5.2247	5.2262
c	4.4939	4.4943	4.4951½	4.4978	4.4953
d	3.7639½	3.7665½	3.7671	3.7666	3.7660
e	3.0031	3.0006	3.0087	3.0044	3.0042
a.	5.9516½	5.9501	5.9484	5.9503	5.9501
b.	5.2275	5.2251	5.2232	5.2248½	5.2252
c.	4.4957½	4.4917½	4.4933½	4.4947½	4.4939
d.	3.7629	3.7585	3.7665	3.7632½	3.7628
e.	3.0089½	3.0127½	3.0105	3.0106	3.0107

RINGS DETACHED.

a	5.9570	5.9558	5.9585	5.9588	5.9575
b	5.2284	5.2263	5.2268	5.2254	5.2267
c	4.4941	4.4915	4.4952	4.4984	4.4955
d	3.7639	3.7667	3.7673	3.7668	3.7662
e	3.0027	3.0008	3.0087	3.0043	3.0041
a.	5.9539	5.9504	5.9477	5.9518	5.9509
b.	5.2283	5.2258	5.2233	5.2253	5.2257
c.	4.4939	4.4918	4.4936	4.4949	4.4940
d.	3.7629	3.7586½	3.7668	3.7634	3.7629
e.	3.0090	3.0128	3.0105	3.0105	3.0107

COMPUTED STRESSES.

Rings.	Mean diameters.		Initial strains.	Initial stresses per square inch.	
	Before cutting up.	After cutting up.		Tension.	Compression.
	Inches.	*Inches.*	*Inch.*	*Pounds.*	*Pounds*
a	5.9565	5.9575	+.0010	....	5,637
b	5.2262	5.2267	+.0005	....	2,870
c	4.4953	4.4956	+.0003	....	2,003
d	3.7661	3.7662	+.0001	....	797
e	3.0042	3.0041	−.0001	999	....
a.	5.9501	5.9509	+.0008	....	4,034
b.	5.2252	5.2257	+.0005	....	2,871
c.	4.4939	4.4940	+.0001	....	668
d.	3.7628	3.7629	+.0001	....	797
e.	3.0107	3.0107	0.	0.	0.

DETACHED SLICE *a*..–*e*..

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a..	5.9637	5.9680	5.9660	5.9661	5.9660
b..	5.2160	5.2172	5.2166	5.2155	5.2163
c..	4.5156	4.5117	4.5192	4.5150	4.5154
d..	3.7749	3.7801	3.7794	3.7798	3.7786
e..	3.0287	3.0291	3.0355	3.0286	3.0305

[Heated cherry red and tempered with oil at 65° Fahr., cooling from the bore.]

a..	5.9620	5.9662	5.9651	5.9650	5.9646
b..	5.2137	5.2156	5.2156	5.2141	5.2148
c..	4.5134	4.5095	4.5180	4.5135	4.5136
d..	3.7725	3.7780	3.7781	3.7781	3.7767
e..	3.0261	3.0270	3.0343	3.0268	3.0286

MEASUREMENTS TAKEN AS RINGS WERE DETACHED.

RING *e*.. DETACHED.

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a..	5.9606	5.9650	5.9641	5.9638	5.9634
b..	5.2120	5.2142	5.2143	5.2125	5.2132
c..	4.5116	4.5079	4.5164	4.5119	4.5120
d..	3.7704	3.7763	3.7764	3.7762	3.7748
e..	3.0295	3.0306	3.0381	3.0304	3.0321

RING *d*.. DETACHED.

a..	5.9591	5.9636	5.9627	5.9622	5.9619
b..	5.2107	5.2129	5.2130	5.2112	5.2120
c..	4.5102	4.5066	4.5151	4.5105	4.5106
d..	3.7736	3.7788	3.7789	3.7790	3.7776

RING *c*.. DETACHED.

a..	5.9583	5.9627	5.9612	5.9611	5.9608
b..	5.2100	5.2122	5.2118	5.2101	5.2110
c..	4.5113	4.5075	4.5173	4.5124	4.5121

RINGS *a*.. AND *b*.. DETACHED.

a..	5.9582	5.9633	5.9613	5.9613	5.9610
b..	5.2109	5.2129	5.2115	5.2108	5.2115

DETACHED SLICE a . . . - e . . .

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a . . .	5.9696	5.9709	5.9711	5.9708	5.9706
b . . .	5.2245	5.2230	5.2233	5.2265	5.2243
c . . .	4.5366	4.5330	4.5348	4.5287	4.5333
d . . .	3.7678	3.7726	3.7682	3.7689	3.7694
e . . .	3.0287	3.0268	3.0279	3.0282	3.0279

[Hardened by heating low cherry red and cooling with water at 50° Fahr. from the bore.]

a . . .	5.9669	5.9686	5.9696	5.9689	5.9685
b . . .	5.2221	5.2206	5.2218	5.2244	5.2221
c . . .	4.5245	4.5310	4.5333	4.5271	4.5290
d . . .	3.7653	3.7700	3.7663	3.7668	3.7671
e . . .	3.0257	3.0237	3.0254	3.0259	3.0252

MEASUREMENTS TAKEN AS RINGS WERE DETACHED.

RING *e* . . . DETACHED.

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a . . .	5.9652	5.9675	5.9689	5.9677	5.9673
b . . .	5.2202	5.2168	5.2207	5.2230	5.2207
c . . .	4.5225	4.5293	4.5327	4.5256	4.5275
d . . .	3.7628	3.7678	3.7651	3.7649	3.7652
e . . .	3.0301	3.0287	3.0310	3.0312	3.0302

[Heated bright red and cooled with water at 80° Fahr. from the bore.]

a . . .	5.9703	5.9734	5.9527	5.9552	5.7629
b . . .	5.2217	5.2224	5.2016	5.2072	5.2132
c . . .	4.5312	4.5299	4.5097	4.5063	4.5193
d . . .	3.7599	3.7659	3.7657	3.7439	3.7589

RING *d* . . . DETACHED.

a . . .	5.9655	5.9681	5.9473	5.9498	5.9577
b . . .	5.2164	5.2166	5.1959	5.2012	5.2075
c . . .	4.5154	4.5238	4.5035	4.5000	4.5107
d . . .	3.7714	3.7755	3.7556	3.7626	3.7663

RING *c* . . . DETACHED.

a . . .	5.9621	5.9636	5.9435	5.9470	5.9541
b . . .	5.2128	5.2120	5.1916	5.1980	5.2036
c . . .	4.5216	4.5301	4.5108	4.5066	4.5173

RINGS *a* . . . AND *b* . . . DETACHED.

a . . .	5.9627	3.9645	5.9398	5.9440	5.9528
b . . .	5.2150	5.2137	5.1944	5.1996	5.2057

CYLINDER No. 21.

FINISHED DIMENSIONS.

Length ....inches..	3.96
Inside diameter ....do....	2.82
Outside diameter ....do....	6.21

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a	4.3348	4.3407	4.3349½	4.3422	4.3382
b	3.4358	3.4356	3.4412½	3.4392	3.4379
a . . .	4.9123	4.9388	4.9385	4.9384	4.9320
b . . .	3.4374	3.4414	3.4457	3.4417	3.4415

[Cylinder cut in halves at middle of length.]

a .	4.3598	4.3535	4.3579	4.3578	4.3572
b .	3.4364	3.4340	3.4338	3.4381	3.4356
a . .	4.9416	4.9409	4.9454	4.9449	4.9432
b . .	3.4534	3.4576	3.4536	3.4567	3.4553

[Cylinder turned down to finished diameters of naked tube.]

END *a* - *a* .

Diameters: exterior, 4″.6; *bore*, 3″.2.

a	4.3351	4.3411	4.3352	4.3427	4.3385
b	3.4354	3.4360½	3.4416	3.4394	3.4381
a .	4.3599	4.3538	4.3582	4.3581	4.3575
b .	3.4365	3.4339	3.4339	3.4384	3.4357

END *a* . . - *a* . . .

Diameters: exterior, 5″.2; *bore*, 3.″2.

a . .	4.9415	4.9407	4.9453	4.9450	4.9431
b . .	3.4584	3.4571	3.4534	3.4509	3.4552
a . . .	4.9123	4.9388	4.9387	4.9387	4.9321
b . . .	3.4375	3.4412	3.4458	3.4421	3.4417

INITIAL STRESSES COMPUTED AFTER THE CYLINDER WAS TURNED DOWN TO FINISHED DIAMETERS OF NAKED TUBE.

Rings.	Mean diameters.		Initial strains.	Initial stresses per square inch.	
	Before turning down.	After turning down.		Tension.	Compression.
	Inches.	*Inches.*	*Inch.*	*Pounds.*	*Pounds.*
a	4.3382	4.3383	+.0003	....	2,075
b	3.4379	3.4381	+.0002	....	1,745
a .	4.3572	4.3575	+.0003	....	2,065
b .	3.4356	3.4357	+.0001	....	861
a . .	4.9432	4.9431	−.0001	607	....
b . .	3.4553	3.4552	−.0001	868	....
a . . .	4.9320	4.9321	+.0001	....	608
b . . .	3.4415	3.4417	+.0002	....	1,748

RINGS DETACHED.

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a	4.3349	4.3415½	4.3355	4.3428	4.3387
b	3.4353	3.4350	3.4415	3.4394	3.4380
a.	4.3600	4.3538	4.3579	4.3578	4.3574
b.	3.4364	3.4337	3.4330	3.4365	3.4356
a..	4.9418	4.9408	4.9458	4.9444	4.9432
b..	3.4535	3.4560½	3.4537	3.4570	3.4553
a...	4.9122	4.9392	4.9388	4.9385	4.9322
b...	3.4375	3.4411	3.4458	3.4419½	3.4416

INITIAL STRESSES COMPUTED AFTER THE RINGS WERE DETACHED.

Rings.	Mean diameters.		Initial strains.	Initial stresses per square inch.	
	Before turning down.	After cutting up.		Tension.	Compression.
	Inches.	*Inches.*	*Inch.*	*Pounds.*	*Pounds.*
a	4.3382	4.3387	+.0005	....	3,457
b	3.4379	3.4380	+.0001	....	872
a.	4.3572	4.3574	+.0002	....	1,377
b.	3.4356	3.4356	0.	0	0
a..	4.9432	4.9432	0.	0	0
b..	3.4553	3.4553	0.	0	0
a...	4.9320	4.9322	+.0002	....	1,217
b...	3.4415	3.4416	+.0001	....	872

INITIAL STRAINS IN SLICES FROM TUBE NO. 2, 8-INCH STEEL B. L. RIFLE.

These slices were received from Lieut. L. L. Bruff, U. S. Army, West Point Foundery.

The approximate dimensions when received at the Watertown Arsenal were as follows:

[In inches.]

	Internal diameter.	External diameter.	Lengths.
Breech slice	7.9	15.75	1.25
Muzzle slice	7.9	14.16	1.25

Slices turned down to 1″ in length.

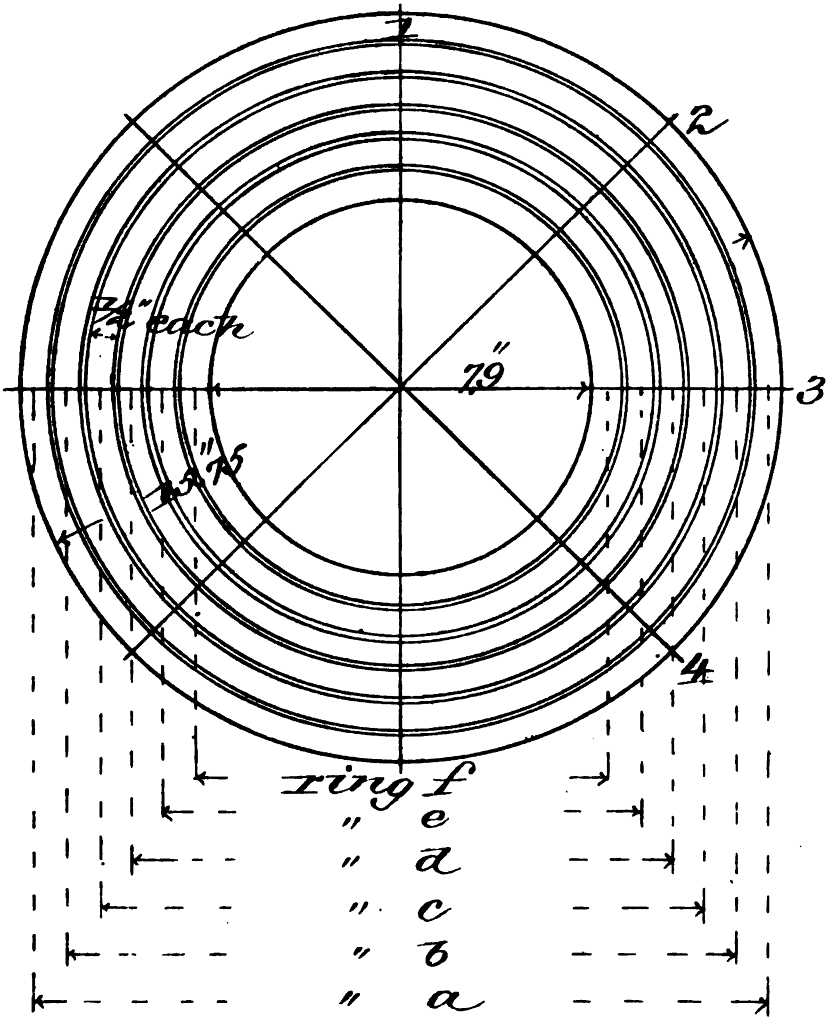
In computing the stresses the modulus of elasticity is assumed to be 30,000,000 pounds per square inch.

NOTE.—These tests were conducted in a similar manner to the tests of the slices from 3″.2 rifle tubes Nos. 7, 8, and 21, fully described elsewhere in this report.

8 inch Steel B. L. Rifle

Tube No. 2

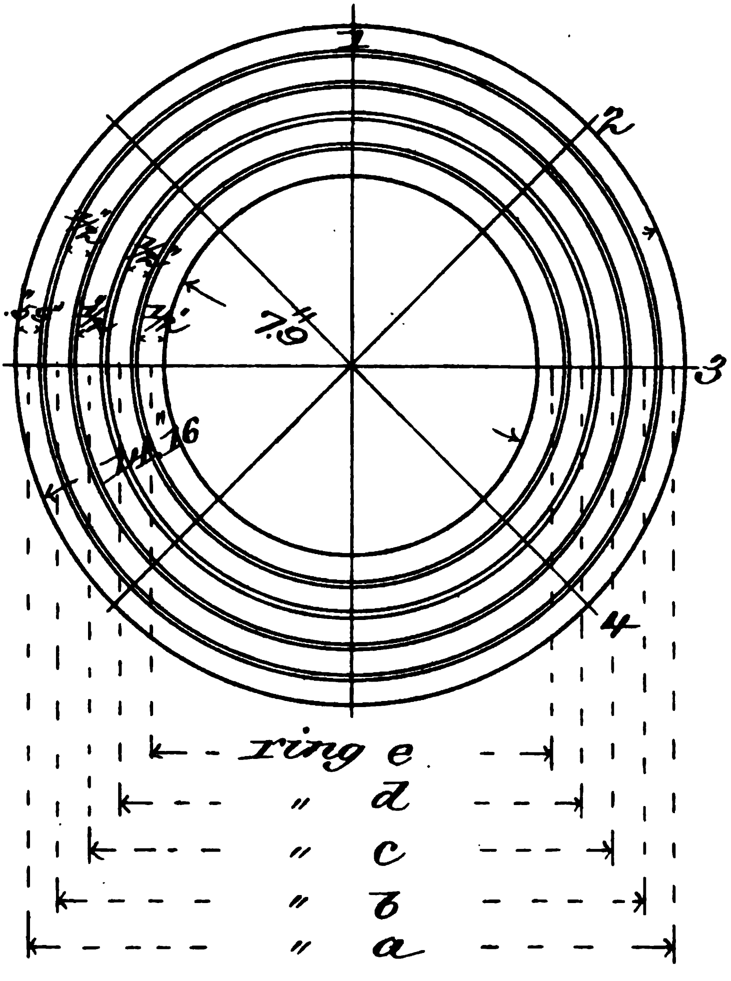
Breech slice



8 inch steel B. L. Rifle

Tube No. 2

Muzzle slice



H Ex No 16 50, 1.

MEASUREMENTS OF BREECH SLICE.

RINGS IN SLICE BEFORE DETACHING.

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a	15.2492	15.2536	15.2491	15.2506	15.2506
b	13.8947	13.8972	13.8957	13.8947	13.8956
c	12.5290	12.5353	12.5203	12.5313	12.5312
d	11.1669	11.1673	11.1663	11.1649	11.1664
e	9.7805	9.7843	9.7890	9.7855	9.7871
f	8.4086	8.4101	8.4066	8.4124	8.4094
RINGS DETACHED.					
a	15.2487	15.2557	15.2538	15.2493	15.2519
b	13.8946	13.8983	13.8956	13.8941	13.8957
c	12.5294	12.5356	12.5296	12.5318	12.5315
d	11.1671	11.1669	11.1649	11.1655	11.1661
e	9.7898	9.7842	9.7899	9.7867	9.7877
f	8.4107	8.4119	8.4081	8.4137	8.4111

MEASUREMENTS OF MUZZLE SLICE.

RINGS IN SLICE BEFORE DETACHING.

[In inches.]

Rings.	Diameters.				Means.
	1	2	3	4	
a	13.4957	13.4919	13.4949	13.4929	13.4939
b	12.2482	12.2495	12.2484	12.2498	12.2490
c	10.9234	10.9225	10.9229	10.9295	10.9246
d	9.6619	9.6619	9.6627	9.6620	9.6621
e	8.3830	8.3795	8.3807	8.3769	8.3800
RINGS DETACHED.					
a	13.4979	13.4935	13.4945	13.4910	13.4950
b	12.2485	12.2495	12.2494	12.2504	12.2495
c	10.9228	10.9218	10.9223	10.8287	10.9239
d	9.6621	9.6619	9.6631	9.6626	9.6624
e	8.3836	8.3803	8.3819	8.3779	8.3809

COMPUTED STRESSES.

BREECH SLICE.

Rings.	Mean diameters.		Initial strains.	Initial stresses per square inch.	
	Before cutting up.	After cutting up.		Tension.	Compression.
	Inches.	*Inches.*	*Inch.*	*Pounds.*	*Pounds.*
a	15.2506	15.2519	+.0013	....	2,557
b	13.8956	13.8957	+.0001	....	216
c	12.5312	12.5315	+.0003	....	718
d	11.1664	11.1661	−.0003	806	....
e	9.7871	9.7877	+.0006	....	1,839
f	8.4094	8.4111	+.0017	....	6,065

MUZZLE SLICE.

a	13.4939	13.4950	+.0011	....	2,446
b	12.2490	12.2495	+.0005	....	1,225
c	10.9246	10.9239	−.0007	1,922	....
d	9.6621	9.6624	+.0003	....	931
e	8.3800	8.3809	+.0009	....	3,222

FRICTIONAL RESISTANCE OF STEEL HOOPS SHRUNK UPON STEEL TUBES—SECOND SERIES.

The hoops and tubes were received at Watertown Arsenal from the West Point Foundery in their finished condition. The diameters were measured and the pieces then returned to the West Point Foundery for assembling. At this time the 4-inch tube was found badly rusted and was cleaned with emery and oil, thereby, according to Captain Birnie's measurements taken at West Point Foundery, increasing the mean diameter of the bore ".0005; the decrease in exterior diameter was almost inappreciable—less than ".0001.

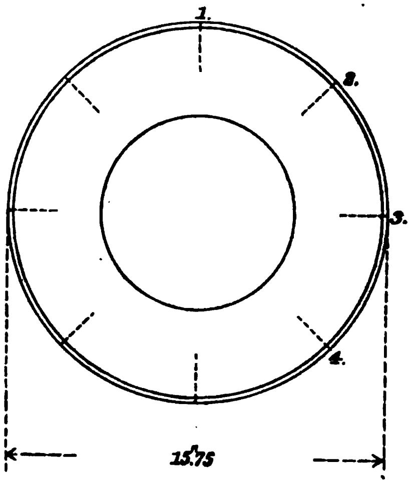
After assembling they were returned to the Watertown Arsenal, when the accessible diameters were again measured.

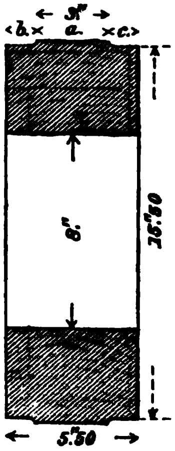
The unhooping was done by forcing axially the hoops from their respective tubes, weighing at the time the frictional resistances, the maximum loads required to start the slipping, and the loads on the specimens at frequent intervals until unhooping was completed.

The high shrinkage under which this series was assembled caused some flow of the metal at the frictional surfaces during the process of unhooping.

This fact led to a special experiment in order to determine the effect on the diameter of the bore of a cylinder whose exterior cylindrical surface had been disturbed and cold flow caused by hammering that surface.

For this experiment the 3-inch tube of the first series of frictional-resistance tests was employed, the dimensions of which appear on the following sketch:





The hammering was done with medium blows of a 20-ounce hammer, striking with the round pein.

The diameters of the bore were measured along two lines—Nos. 1 and 3.

ORIGINAL DIAMETERS.

TABLE No. 1.

[In inches.]

Distance from top.	Diameters.	
	1	3
0.5	7.9970	7.9971
2.75	7.9980	7.9980
5.00	7.9980	7.9988
Means	7.99793	7.99797

Sections a, b, and c hammered at both extremities of diameter No. 3.

TABLE No. 2.

[In inches.]

Distance from top.	Diameters.	
	1	3
0.5	7.9969	7.9975
2.75	7.9978	7.9987
3.00	7.9986	7.9993
Means	7.99777	7.9985

The effect of this hammering was to decrease the mean length of diameter No. 1 ″.00016, and increase the mean length of diameter No. 3 ″.00053.

Sections a, b, and c hammered at one extremity of diameter No. 1.

TABLE No. 3.

[In inches.]

Distance from top.	Diameters.	
	1	3
0.5	7.9972	7.9975
2.75	7.9982	7.9988
5.00	7.9999	7.9992
Means	7.99813	7.9985

No change is found in diameter No. 3, but diameter No. 1 is increased ″.00036.

Sections a, b, and c hammered at other extremity of diameter No. 1.

TABLE No. 4.

[In inches.]

Distance from top.	Diameters.	
	1	3
0.5	7.9973	7.9973
2.75	7.9084	7.9985
5.00	7.9991	7.9990
Means	7.99827	7.99827

Diameter No. 1 shows a further increase of ″.00014, while diameter No. 3 shows a decrease of ″.00023.

The remaining portion of the exterior surface section a, now hammered.

TABLE No. 5.

[In inches.]

Distance from top.	Diameters.	
	1	3
0.5	7.9974	7.9973
2.75	7.9988	7.9985
5.00	7.9992	7.9989
Means	7.99847	7.99823

Diameter No. 1 shows a further increase of ″.00020.
Diameter No. 3 shows a decrease of ″.00004.

The remaining portion of the exterior cylindrical surface now hammered.

TABLE No. 6.

[In inches.]

Distance from top.	Diameters.	
	1	3
0.5	7.9978	7.9973
2.75	7.9992	7.9987
5.00	7.9996	9.9991
Means	7.99887	7.99837

Diameter No. 1 shows a further increase of ″.00040. Diameter No. 3 shows an increase of ″.00014.

The total enlargement of the bore, the average of both diameters, is ″.00067.

It was thought that the direct effect of the hammer blows did not penetrate the metal to any great depth, and that the enlargement of the entire ring, as shown by the increased diameter of the bore, resulted from intense initial strains in the outside cylindrical zone of metal.

Accounting for the presence of initial strains by the effect of hammer blows causing flow of the metal at and near the surface, thereby diminishing its density, so much of the metal as was thus affected would be placed in a state of initial compression, in its efforts to assume a zone of greater diameter, while the remaining metal of the tube would be placed in a state of initial tension.

In a similar manner is explained the difference in the behavior of the diameters Nos. 1 and 3 at the intermediate stages, when the exterior surface was only partially hammered.

The tube was next put in a lathe and the outside metal of section *a* turned down one-eighth of an inch on a side, reducing the diameter from 15″.75 to 15″.50, then the diameters measured as follows:

TABLE No. 7.

[In inches.]

Distance from top.	Diameters	
	1	3
0.5	7.9977	7.9972
2.75	7.9986	7.9983
5.00	7.9991	7.9990
Means	7.99847	7.99817

Diameter No. 1 shows a contraction of ″.00040. Diameter No. 3 shows a contraction of ″.00020.

End sections b and c turned down one-eighth of an inch on a side, reducing the diameter from 15″.50 *to* 15″.25.

TABLE No. 8.

[In inches.]

Distance from top.	Diameters.	
	1	3
0.5	7.9972	7.9968
2.75	7.9983	7.9979
5.00	7.9988	7.9985
Means	7.99810	7.99773

Diameter No. 1 shows a further contraction of ″.00037. Diameter No. 3 shows a further contraction of ″.00044.

The mean diameter of the tube is now 7″.9979, the same as the original diameter within the limits of the micrometer readings; from which it appears that the removal of one-eighth inch depth of metal practically released the initial strains caused by hammering.

These results may have been influenced somewhat by initial strains already existing in the metal prior to these experiments; it is improbable, however, that any were of sufficient intensity to have materially affected the results obtained.

MEASUREMENTS OF HOOPS AND TUBES AND DETAILS OF TESTS.

EXTERIOR DIAMETER OF 3-INCH HOOP.

BEFORE ASSEMBLING.

[In inches.]

Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	20.3060	20.3062	20.3061	20.3061	20.3061
1.5	20.3062	20.3065	20.3064	20.3062	20.306325
2.5	20.3069	20.3070	20.3072	20.3070	20.307025
Means	20.30636	20.30657	20.30657	20.30643	20.306483

AFTER ASSEMBLING.

0.5	20.3299	20.3311	20.3318	20.3301	20.330725
1.5	20.3302	20.3315	20.3318	20.3305	20.331000
2.5	20.3313	20.3325	20.3332	27.3317	20.332175
Means	20.33047	20.33170	20.33226	20.33077	20.331300

AFTER DISMANTLING.

0.5	20.3077	20.3075	20.3071	20.3073	20.307400
1.5	20.3078	20.3076	20.3073	20.3075	20.307550
2.5	20.3086	20.3081	20.3080	20.3083	20.308250
Means	20.30803	20.30773	20.30746	20.30770	20.307773

INTERIOR DIAMETERS OF 3-INCH HOOP.

BEFORE ASSEMBLING.

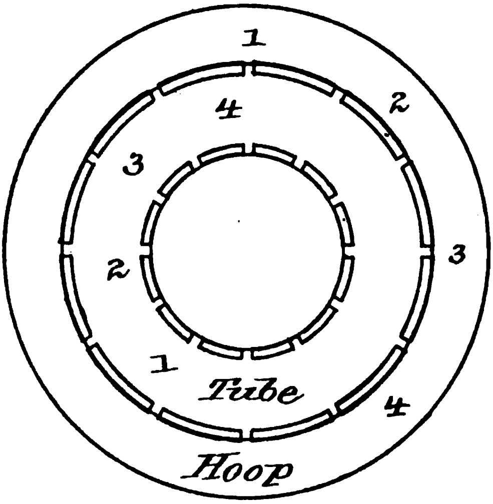
[In inches.]

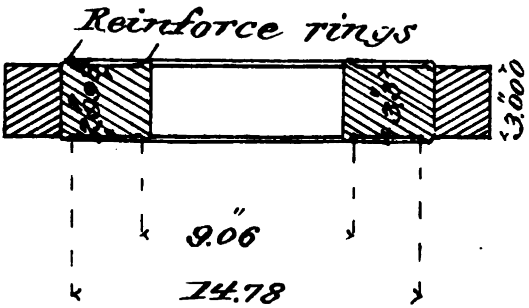
Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	15.7497	15.7500	15.7501	15.7497	15.749875
1.5	15.7494	15.7499	15.7499	15.7495	15.749675
2.5	15.7491	15.7497	15.7496	15.7492	15.749400
Means	15.74940	15.74986	15.74987	15.74946	15.74965

AFTER DISMANTLING.

0.5	15.7517	15.7516	15.7515	15.7512	15.7515
1.5	15.7511	15.7512	15.7509	15.7508	15.7510
2.5	15.7505	15.7506	15.7504	15.7503	15.75045
Means	15.75110	15.75113	15.75093	15.75077	15.750983

3 inch Hoop and Tube





EXTERIOR DIAMETERS OF TUBE WITH 3-INCH HOOP.

BEFORE ASSEMBLING.

[In inches.]

Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	15.7871	15.7874	15.7861	15.7867	15.786825
1.5	15.7870	15.7872	15.7862	15.7867	15.786775
2.5	15.7871	15.7874	15.7862	15.7868	15.786875
Means	15.78707	15.78733	15.78617	15.78 73	15.786825

AFTER DISMANTLING.

Distance from top.	1	2	3	4	Means.
0.5	15.7860	15.7863	15.7852	15.7854	15.785725
1.5	15.7861	15.7864	15.7853	15.7858	15.785900
2.5	15.7863	15.7864	15.7852	15.7858	16.785925
Means	15.78613	15.78637	15.78523	15.78567	15.785850

DIAMETERS OF BORE OF TUBE WITH 3-INCH HOOP.

BEFORE ASSEMBLING.

[In inches.]

Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	7.9987	7.9987	7.9989	7.9984	7.998675
1.5	7.9991	7.9990	7.9992	7.9990	7.999075
2.5	7.9985	7.9982	7.9984	7.9982	7.998325
Means	7.99877	7.99864	7.99883	7.99853	7.9986917

AFTER ASSEMBLING.

Distance from top.	1	2	3	4	Means.
0.5	7.9906	7.9917	7.9909	7.9896	7.9907
1.5	7.9907	7.9916	7 9909	7.9900	7.9908
2.5	7.9903	7.9911	7.9902	7.9894	7.99025
Means	7.99053	7.99147	7.99066	7.98967	7.990583

AFTER DISMANTLING.

Distance from top.	1	2	3	4	Means.
0.5	7.9989	7.9990	7,9990	7.9088	7.998925
1.5	7.9986	7.9986	7.9989	7.9988	7.998725
2.5	7.9976	7.9977	7.9978	7.9977	7.997700
Means	7.99837	7.99843	7.99857	7.99843	7.998450

EXTERIOR DIAMETERS OF 4-INCH HOOP.

BEFORE ASSEMBLING.

[In inches.]

Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	20.3085	20.3087	20.3086	20.3086	20.30860
2.0	20.3099	20.3098	20.3100	20.3101	20.30995
3.5	20.3110	20.3110	20.3123	20.3115	20.31145
Means	20.30980	20.30983	20.31030	20.31007	20.31000

AFTER ASSEMBLING.

0.5	20.3313	20.3318	20.3319	20.3321	20.331775
2.0	20.3323	20.3328	20.3330	20.3333	20.332850
3.5	20.3343	20.3347	20.3342	20.3350	20.334550
Means	20.33263	20.33310	20.33303	20.33347	20.3330583

AFTER DISMANTLING.

0.5	20.3100	20.3099	20.3099	20.3098	20.3099
2.0	20.3111	20.3111	20.3111	20.3114	20.311175
3.5	20.3122	20.3123	20.3123	20.3124	20.3123
Means	20.3111	20.3111	20.3111	20.3112	20.311125

INTERIOR DIAMETERS OF 4-INCH HOOP.

BEFORE ASSEMBLING.

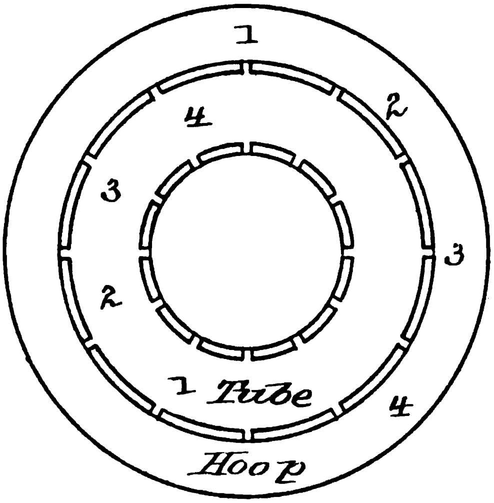
[In inches.]

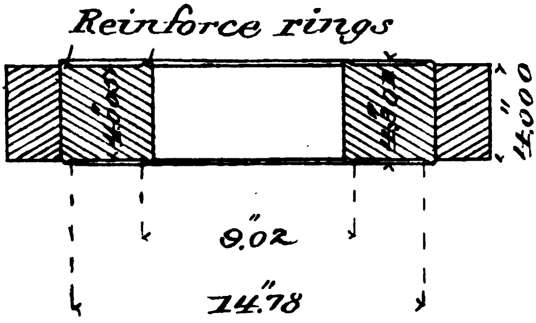
Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	15.7499	15.7493	15.7492	15.7496	15.749500
2.0	15.7496	15.7491	15.7492	15.7496	15.749375
3.5	15.7496	15.7492	15.7494	15.7498	15.749500
Means	15.74970	15.74920	15.74926	15.74967	15.7494583

AFTER DISMANTLING.

0.5	15.7509	15.7504	15.7503	15.7506	15.75055
2.0	15.7504	15.7501	15.7501	15.7504	15.75025
3.5	15.7503	15.7501	15.7501	15.7505	15.75025
Means	15.75053	15.75020	15.75017	15.75050	15.75035

4 inch Hoop and Tube





EXTERIOR DIAMETERS OF TUBE WITH 4-INCH HOOP.

BEFORE ASSEMBLING.

[In inches.]

Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	15.7866	15.7861	15.7873	15.7871	15.786775
2.0	15.7866	15.7856	15.7869	15.7867	15.786450
3.5	15.7866	15.7859	15.7867	15.7867	15.786475
Means	15.78660	15.78587	15.78697	15.78683	15.786570

AFTER DISMANTLING.

0.5	15.7853	15.7847	15.7863	15.7857	15.785500
2.0	15.7852	15.7846	15.7856	15.7852	15.785150
3.5	15.7849	15.7842	15.7853	15.7851	15.784875
Means	15.785133	15.78450	15.78573	15.78533	15.785175

DIAMETERS OF BORE OF TUBE WITH 4-INCH HOOP.

BEFORE ASSEMBLING.

[In inches.]

Distance from top.	Diameters.				Means.
	1	2	3	4	
0.5	7.9988	7.9987	7.9989	7.9987	7.998775
2.0	7.9994	7.9990	7.9993	7.9993	7.999250
3.5	7.9988	7.9987	7.9987	7.9986	7.998700
Means	7.99900	7.99880	7.99896	7.99887	7.9989083

AFTER ASSEMBLING.

0.5	7.9912	7.9918	7.9917	7.9907	7.991350
2.0	7.9914	7.9919	7.9918	7.9913	7.991600
3.5	7.9915	7.9917	7.9918	7.9914	7.991600
Means	7.99136	7.99180	7.99177	7.99113	7.991517

AFTER DISMANTLING.

0.5	7.9997	7.9995	7.9997	7.9994	7.999575
2.0	7.9996	7.9995	7.9997	7.9998	7.999650
3.5	7.9993	7.9993	7.9993	7.9991	7.999250
Means	7.99953	7.99943	7.99957	7.99943	7.9994917

FRICTIONAL RESISTANCE BETWEEN TUBE AND 3-INCH HOOP.

DETAILS.

Applied loads.	Total movement.	Remarks.
Pounds.	*Inches.*	
50,000	0.	Initial load.
100,000	.0037	
150,000	.0075	
200,000	.0118	
250,000	.0237	
300,000	.0289	
350,000	.0338	
360,000	.0347	
380,000	.0367	
400,000	.0385	
420,000	.0403	
440,000	.0422	
460,000	.0443	
480,000	.0461	
500,000	.0480	
520,000	.0499	
540,000	.0516	
560,000	.0537	
580,000	.0557	
600,000	.0576	
620,000	.0597	
623,800	....	Ultimate resistance.
233,000	.16	
425,000	....	Highest resistance after first slip.
345,000	.2010	
333,000	.2012	Rested 1 hour.
427,000	....	Resistance after resting.
426,000	....	Sudden slip.
385,000	.27	
423,000	.32	
405,000	.34	
370,000	.39	
358,000	.42	
354,000	.46	
358,000	.50	
359,000	.54	
358,000	.58	
343,000	.68	
330,000	.80	
315,000	.87	
305,000	.94	
298,000	1.00	
288,000	1.06	
263,000	1.20	
254,000	1.25	
252,000	1.33	
223,000	1.46	
222,000	1.51	
217,000	1.59	
213,000	1.63	
206,000	1.67	
203,000	1.69	
195,000	1.70	
188,000	1.79	
184,000	1.83	
178,000	1.87	
172,000	1.92	
162,000	1.99	
160,000	2.05	
156,000	2.08	
153,000	2.11	
147,000	2.16	
140,000	2.24	
136,000	2.28	
131,000	2.35	
122,000	2.40	
115,000	2.47	
108,000	2.66	
102,000	2.71	
99,000	2.77	
88,000	2.85	
80,000	2.92	
77,000	2.94	

There was a sudden slip of ".16 of the hoop on the tube at the time the ultimate resistance was reached, accompanied by a loud report.

The remainder of the unhooping was characterized by sudden slips of the hoop, and violent fluctuations of the loads required to continue the movement of the hoop.

The exterior cylindrical surface of the tube received a high polish while unhooping. A burr was thrown up at the edge of the hoop which came off last, covering about 200 degrees of arc, and included the marked ends of the diameters 1 to 4, inclusive.

There was a slight flow of metal from the exterior cylindrical surface of the tube into the ends of the grooves of the outer reinforce ring.

FRICTIONAL RESISTANCE BETWEEN TUBE AND 4-INCH HOOP.

DETAILS.

Applied loads.	Total movement.	Remarks.
Pounds.	*Inches.*	
50,000	0.	Initial load.
100,000	.0028	
150,000	.0058	
200,000	.0090	
250,000	.0120	
300,000	.0152	
350,000	.0185	
400,000	.0220	
450,000	.0260	
500,000	.0300	
550,000	.0338	
600,000	.0379	
650,000	.0425	
674,000	....	Ultimate resistance.
260,000	.14	
355,000	....	Highest resistance after above slip.
328,000	.22	
330,000	.25	
323,000	.30	
322,500	.35	
321,000	.40	
320,500	.45	
320,400	.50	Smooth continuous movement up to this time.
317,000	.55	
308,800	.60	
305,000	.75	
270,000	.85	
278,000	.95	
281,000	1.00	
283,000	1.05	
276,000	1.10	
274,000	1.15	
302,000	....	
282,000	1.25	
262,000	1.30	
258,000	1.35	
255,000	1.40	
253,000	1.45	
244,000	1.50	
243,000	1.55	
240,000	1.60	
233,000	1.65	
229,000	1.70	
225,000	1.75	
217,000	1.80	
212,000	1.85	
211,000	1.90	
210,000	1.95	
205,000	2.00	
202,000	2.05	
198,000	2.10	
196,000	2.15	
192,000	2.20	
189,000	2.25	
186,000	2.30	

DETAILS—Continued.

Applied loads.	Total movement.	Remarks.
Pounds.	*Inches.*	
182,000	2.35	
176,000	2.40	
171,000	2.45	
166,000	2.50	
161,000	2.55	
158,000	2.60	
149,000	2.70	
140,000	2.80	
135,000	2.90	
125,000	3.00	
115,000	3.10	
109,000	3.20	
102,000	3.30	
98,000	3.40	
93,000	3.50	
91,000	3.60	
88,000	3.70	
81,000	3.80	
79,000	3.90	

Under the maximum load the hoop slipped on the tube a distance of ″.14, accompanied by a loud report.

There was a smooth, continuous movement of the hoop until it had been forced along ″.50. After this the movement of the hoop was irregular and characterized by sudden slips, with violent fluctuations of the loads.

The exterior cylindrical surface of the tube was highly polished by the act of unhooping.

A burr was thrown up along that edge of the hoop which came off last, covering about 200 degrees of arc, and included the marked ends of the diameters 1, 2, and 3.

There was a slight flow of metal from the exterior cylindrical surface of the tube into the ends of the grooves of the reinforce ring.

TEMPERATURE TESTS.

A number of tests of this series have been made and are recorded in earlier reports; certain results here appear, and subsequent reports will contain additional data.

It is intended to make this a comprehensive series of tests of wrought iron, steel, and cast-iron bars, upon the topics enumerated below:

TENSILE TESTS AT DIFFERENT TEMPERATURES.
COMPRESSION TESTS.
CRUSHING TESTS, AND COLD FLOW OF SHORT CYLINDERS.
CO-EFFICIENTS OF EXPANSION.
MODULI OF ELASTICITY AT DIFFERENT TEMPERATURES.
SPECIFIC GRAVITY DETERMINATIONS.
INITIAL STRAINS.
REPEATED STRESSES.
BENDING TESTS.
SHEARING TESTS.

The most prominent features of the series will consist of the observations made on the hot bars, but the opportunities here offered with the several grades of metal represented are availed of to extend the series and include many cold tests.

The results of each class, so far as they have been developed, will be discussed separately, and precede the introduction of the details to which they pertain.

TENSILE TESTS—STEEL BARS.

CHEMICAL COMPOSITION.

Marks.	Carbon.	Manganese.	Silicon.
	Per cent.	*Per cent.*	*Per cent.*
1-833	.09	.11	....
2-123	.20	.45	....
3-782	.31	.57	....
4-795	.37	.70	....
5-803	.51	.58	.02
6-797	.57	.93	.07
7-823	.71	.58	.08
8-750	.81	.56	.17
9-756	.89	.57	.19
10-334	.97	.80	.28

The specimens were taken from bars 1¼″ diameter of open-hearth steel as described in Report of 1886.

The total length of the specimens was 36″, with ends 1¼″ diameter, threaded 10 per inch, Franklin Institute standard shape. The stems were turned a length of 32″, of which 30″ was used as the gauged length, where the bars were reduced to 1″.0092 diameter. In this condition the modulus of elasticity of each was determined as recorded in Report of 1886.

After a period of rest the tests were resumed and carried to final rupture, the stems now, with the exception of Nos. 1, 2, and the first bar of No. 7, being turned down to smaller diameters.

The first bar No. 7 broke in the head at the root of the thread, and another bar was prepared with the diameter of the stem reduced to ″.757.

Less ductile metals require a greater difference between the areas of the stem and at the root of the thread in the head, to avoid rupture of the latter, than is required by metal possessing greater ductility.

It is also shown in bars Nos. 8, 9, and 10 how the center-punch marks, which were about ″.01 deep, in the surface of the stems located the places of rupture.

With increased hardness of metal slight imperfections become of serious importance.

A diagram is appended with curves representing the behavior of the several grades of steel from the initial loads up to the time the tensile strength was reached.

When loads are slowly applied the rupture of ductile metal does not occur under the maximum stresses, but while local contraction of area is going on and the load is falling.

The contraction of area usually progresses at a more rapid rate, however, than the loads fall, which results in a higher strength per square inch, measured on the ruptured section, than the tensile strength, which is referred to the original diameter of the bar.

Brittle metal breaks at once, with little or no warning, under the maximum load.

The mechanical work done is computed, beginning with the initial load, and values are given in the tabulation which indicate the amount of work done at the elastic limit, also when the maximum load or tensile strength was reached.

For those bars which failed suddenly and the elongation was not determined at the maximum load, the next lower load and elongation is used in computing the mechanical work.

It is seen that bars having the highest tensile strength were not those which required the most work to cause rupture.

A number of bars show a yielding point immediately upon passing the elastic limit, during which period the metal stretches and takes a considerable set under loads below those which had previously been sustained.

In an earlier report results were shown in which this behavior was repeated in the same bars as higher loads were reached.

The compression tests of this series are included in the Report of 1886.

DETAILS OF TENSILE TESTS.

Tests made at atmospheric temperatures.

No. 753.

Marks, $\frac{1}{838}$
C, .09; Mn, .11.
Diameter, 1".0092.
Sectional area, .80 square inch.
Gauged length, 30".

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0.	0.	Initial load.
1,600	2,000	.0010		
2,400	3,000	.0019		
3,200	4,000	.0029		
4,000	5,000	.0039	0.	
4,800	6,000	.0049		
5,600	7,000	.0059		
6,400	8,000	.0070		
7,200	9,000	.0080		
8,000	10,000	.0089	.0001	
8,800	11,000	.0100		
9,600	12,000	.0110		
10,400	13,000	.0120		
11,200	14,000	.0130		
12,000	15,000	.0140	.0003	
12,800	16,000	.0151		
13,600	17,000	.0161		
14,400	18,000	.0171		
15,200	19,000	.0181		
16,000	20,000	.0191		
16,800	21,000	.0202	.0003	
4,000	5,000	.0043		
8,000	10,000	.0093		
12,000	15,000	.0142		
16,800	21,000	.0202	.0004	
16,800	21,000	.0202	.0004	
Bar rested three months.				
800	1,000		.0004	
17,600	22,000	.0215		
18,400	23,000	.0224		
19,200	24,000	.0234		
20,000	25,000	.0244	.0007	
20,800	26,000	.0255		
21,600	27,000	.0267		
22,400	28,000	.0279		
23,200	29,000	.0290		
24,000	30,000	.0307	.0022	Elastic limit.
24,400	30,500	.0480		
24,800	31,000	.2130		
25,200	31,500	.26		

No. 753—Continued.

Applied loads.		In gauged lengths.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
25,600	32,000	.42	....	
26,400	33,000	.60	....	
27,200	34,000	.65	....	
28,000	35,000	.72	....	
28,800	36,000	.78	....	
29,600	37,000	.87	....	
30,400	38,000	.95	....	
31,200	39,000	1.05	....	
32,000	40,000	1.14	1.09	
	1,000	1.09	....	
	5,000	1.0944	....	
	10,000	1.1000	....	
	15,000	1.1060	....	
	20,000	1.1122	....	
	25,000	1.1185	....	
	30,000	1.1250	....	
	35,000	1.1325	....	
	30,000	1.1271	....	
	25,000	1.1215	....	
	20,000	1.1157	....	
	15,000	1.1095	....	
	10,000	1.1032	....	
	5,000	1.0965	....	
	1,000	1.0914	....	
32,800	41,000	1.27	....	
33,600	42,000	1.38	....	
34,400	43,000	1.50	....	
35,200	44,000	1.67	....	
36,000	45,000	1.86	....	
36,800	46,000	2.03	....	
37,600	47,000	2.28	....	
38,400	48,000	2.51	....	
39,200	49,000	2.86	....	
40,000	50,000	3.28	....	
40,800	51,000	3.96	....	
41,600	52,000	4.68	....	
41,980	52,475	6.32	....	Tensile strength.
31,100	....	....	....	Load at time of rupture.
0	0	7.10	....	=23.6 per cent.

Elongation of inch sections: ″.23, ″.26, ″.29, ″.49, ″.66*, ″.34, ″.31, ″.28, ″.25, ″.24, ″.22, ″.21, ″.21, ″.20, ″.21, ″.21, ″.20, ″.20, ″.20, ″.18, ″.19, ″.20, ″.17, ″.16, ″.16, ″.15, ″.16, ″.18, ″.17, ″.17.

Diameter at fracture, ″.61. Area, .292 square inch. Contraction, 63.5 per cent.

Fractured 6¾″ from neck. Appearance, silky.

No. 754.

Marks, $\frac{2}{123}$
C, .20; Mn, .45.
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
800	1,000	0.	0.	Initial load.
1,600	2,000	.0010	....	
2,400	3,000	.0020	....	
3,200	4,000	.0029	....	
4,000	5,000	.0039	0.	
4,800	6,000	.0049	....	
5,600	7,000	.0060	....	
6,400	8,000	.0070	....	
7,200	9,000	.0080	....	
8,000	10,000	.0090	.0001	
8,800	11,000	.0100	....	
9,600	12,000	.0110	....	
10,400	13,000	.0120	....	
11,200	14,000	.0130	....	
12,000	15,000	.0140	.0001	
12,800	16,000	.0149	....	
13,600	17,000	.0160	....	
14,400	18,000	.0170	....	
15,200	19,000	.0180	....	
16,000	20,000	.0190	....	
16,800	21,000	.0200	.0001	
16,800	21,000	.0200	....	
17,600	22,000	.0210	....	
18,400	23,000	.0220	....	
19,200	24,000	.0230	....	
20,000	25,000	.0240	.0001	
	Bar rested three months.			
800	1,000	....	.0001	
20,800	26,000	.0250	....	
21,600	27,000	.0260	....	
22,400	28,000	.0270	....	
23,200	29,000	.0280	....	
24,000	30,000	.0290	.0003	
24,800	31,000	.0301	....	
25,600	32,000	.0310	....	
26,400	33,000	.0320	....	
27,200	34,000	.0331	....	
28,000	35,000	.0341	.0004	
28,400	35,500	.0347	....	
28,800	36,000	.0351	....	
29,200	36,500	.0357	....	
29,600	37,000	.0361	....	
30,000	37,500	.0368	....	
30,400	38,000	.0372	....	
30,800	38,500	.0377	....	
31,200	39,000	.0382	....	
31,600	39,500	.0388	....	Elastic limit.
32,000	40,000	.4864	....	
32,800	41,000	.50	....	
33,600	42,000	.51	....	
34,400	43,000	.55	....	
35,200	44,000	.59	....	
36,000	45,000	.64	....	
36,800	46,000	.68	....	
37,600	47,000	.73	....	
38,400	48,000	.78	....	
39,200	49,000	.83	....	
40,000	50,000	.89	....	
40,800	51,000	.94	....	
41,600	52,000	1.01	....	
42,400	53,000	1.08	....	
43,200	54,000	1.17	....	
44,000	55,000	1.25	1.17	

No. 754—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
	1,000	1.17	....	
	5,000	1.1742	....	
	10,000	1.1799	....	
	15,000	1.1859	....	
	20,000	1.1921	....	
	25,000	1.1984	....	
	30,000	1.2051	....	
	35,000	1.2117	....	
	40,000	1.2189	....	
	45,000	1.2267	....	
	40,000	1.2212	....	
	35,000	1.2156	....	
	30,000	1.2097	....	
	25,000	1.2033	....	
	20,000	1.1971	....	
	15,000	1.1906	....	
	10,000	1.1840	....	
	5,000	1.1769	....	
	1,000	1.1707	....	
44,800	56,000	1.30	....	
45,600	57,000	1.40	....	
46,400	58,005	1.52	....	
47,200	59,000	1.62	....	
48,000	60,000	1.75	....	
48,800	61,000	1.91	....	
49,600	62,000	2.02	....	
50,400	63,000	2.22	....	
51,200	64,000	2.45	....	
52,000	65,000	2.73	....	
52,800	66,000	3.06	....	
53,600	67,000	3.49	....	
54,400	68,009	4.18	....	
54,710	68,375	5.15	....	Tensile strength.
46,800	....	....	....	Load at time of rupture.
0	0	6.87	....	=21.2 per cent.

Elongation of inch sections: ″.18, ″.20, ″.23, ″.23, ″.24, ″.25, ″.25, ″.27, ″.32, ″.61*, ″.33, ″.28, ″.27, ″.23, ″.22, ″.19, ″.17, ″.16, ″.16, ″.17, ″.15, ″.16, ″.14, ″.13, ″.15, ″.14, ″.14, ″.12, ″.13, ″.15.

Diameter at fracture, ″.72. Area, .407 square inch. Contraction, 49.1 per cent.

Fractured 13″.2 from neck. Appearance, fine silky.

No. 755.

Marks, $\frac{8}{782}$
C, .31 ; Mn, .57.
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0.	0.	Initial load.
1,600	2,000	.0011	....	
2,400	3,000	.0021	....	
3,200	4,000	.0031	....	
4,000	5,000	.0042	.0002	
4,800	6,000	.0052	....	
5,600	7,000	.0062	....	
6,400	8,000	.0074	....	
7,200	9,000	.0084	....	
8,000	10,000	.0094	.0005	
8,800	11,000	.0104	....	
9,600	12,000	.0114	....	
10,400	13,000	.0125	....	
11,200	14,000	.0135	....	
12,000	15,000	.0145	.0006	
12,800	16,000	.0155	....	
13,600	17,000	.0166	....	
14,400	18,000	.0176	....	
15,200	19,000	.0187	....	
16,000	20,000	.0197	....	
16,800	21,000	.0208	.0008	
17,600	22,000	.0218	....	
18,400	23,000	.0228	....	
19,200	24,000	.0238	....	
20,000	25,000	.0248	.0009	
Bar rested six months, and stem turned down to ″.798 diameter=.50 square inch sectional area.				
500	1,000	....	.0009	
15,000	30,000	.0302	.0009	
17,500	35,000	.0355	.0010	
20,000	40,000	.0405	.0011	
20,500	41,000	.0416	....	
21,000	42,000	.0425	....	
21,500	43,000	.0434	....	
22,000	44,000	.0445	....	
22,500	45,000	.0455	.0010	
22,750	45,500	.0460	....	
23,000	46,000	.0466	....	
23,250	46,500	.0471	....	Elastic limit.
21,500	43,000	.0590	....	
21,000	42,000	.0835	....	
21,500	43,000	.1350	....	
22,000	44,000	.32	....	
22,500	45,000	.36	....	
23,000	46,000	.38	....	
23.500	47,000	.40	....	
24,000	48,000	.43	....	
24,500	49,000	.46	....	
25,000	50,000	.50	....	
25,500	51,000	.53	....	
26,000	52,000	.56	....	
26,500	53,000	.60	....	
27,000	54,000	.63	....	
27,500	55,000	.66	....	
28,000	56,000	.71	....	
28,500	57,000	.75	....	
29,000	58,000	.79	....	
29,500	59,000	.83	....	
30,000	60,000	.88	....	
30,500	61,000	.92	....	
31.000	62,000	.98	....	
31,500	63,000	1.04	....	
32,000	64,000	1.10	....	
32,500	65,000	1.15	....	

No. 755—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
33,000	66,000	1.20	....	
33,500	67,000	1.27	....	
34,000	68,000	1.35	....	
34,500	69,000	1.42	....	
35,000	70,000	1.53	....	
35,500	71,000	1.61	....	
36,000	72,000	1.72	....	
36,500	73,000	1.83	....	
37,000	74,000	1.97	....	
37,500	75,000	2.15	....	
38,000	76,000	2.31	....	
38,500	77,000	2.50	....	
39,000	78,000	2.75	....	
39,500	79,000	3.10	....	
40,000	80,000	3.70	....	
40,300	80,600	4.55	....	Tensile strength.
35,800	....	....	....	Load at time of rupture.
0	0	5.39	....	=18.0 per cent.

Elongation of inch sections: ″.13, ″.15, ″.16, ″.18, ″.19, ″.23, ″.28, ″.48*, ″.26, ″.21, ″.20, ″.17, ″.18, ″.18, ″.17, ″.19, ″.18, ″.18, ″.17, ″.15, ″.14, ″.14, ″.12, ″.14, ″.14, ″.12, ″.14, ″.14, ″.14, ″.13.

Diameter at fracture, ″.60. Area, .283 square inch. Contraction, 43.5 per cent.

Fractured 10¼″ from neck. Appearance, silky.

No. 756.

Marks, $\frac{4}{795}$

C, 37; Mn, .70.

Diameter, 1″.0092.

Sectional area, .80 square inch.

Gauged length, 30″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0.	0.	Initial load.
1,600	2,000	.0010	....	
2,400	3,000	.0020	....	
3,200	4,000	.0030	....	
4,000	5,000	.0040	.0001	
4,800	6,000	.0050	....	
5,600	7,000	.0060	....	
6,400	8,000	.0070	....	
7,200	9,000	.0081	....	
8,000	10,000	.0090	.0002	
8,800	11,000	.0102	....	
9,600	12,000	.0112	....	
10,400	13,000	.0122	....	
11,200	14,000	.0132	....	
12,000	15,000	.0142	.0003	
12,800	16,000	.0152	....	
13,600	17,000	.0162	....	
14,400	18,000	.0172	....	
15,200	19,000	.0183	....	
16,000	20,000	.0193	....	
16,800	21,000	.0203	.0004	
17,600	22,000	.0215	....	
18,400	23,000	.0225	....	
19,200	24,000	.0236	....	

No. 756—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
20,000	25,000	.0245	.0005	
Bar rested six months, and stem turned down to ″.798 diameter =.50 square inch sectional area.				
500	1,000	....	.0001	
17,500	35,000	.0344	.0001	
20,000	40,000	.0396	.0001	
20,500	41,000	.0405	....	
21,000	42,000	.0416	....	
21,500	43,000	.0425	....	
22,000	44,000	.0436	....	
22,600	45,000	.0448	.0002	
22,750	45,500	.0451	....	
23,000	46,000	.0458	....	
23,250	46,500	.0462	....	
23,500	47,000	.0468	....	
23,750	47,500	.0472	....	
24,000	48,000	.0480	....	
24,250	48,500	.0485	....	
24,500	49,000	.0489	....	
24,750	49,500	.0495	....	
25,000	50,000	.0500	....	Elastic limit.
22,500	45,000	.0574	....	
22,750	45,500	.0681	....	
23,000	46,000	.1510	....	
23,250	46,500	.2250	....	
23,500	47,000	.30	....	
24,000	48,000	.35	....	
24,500	49,000	.37	....	
25,000	50,000	.40	....	
25,500	51,000	.42	....	
26,000	52,000	.45	....	
27,000	54,000	.52	....	
28,000	56,000	.57	....	
29,000	58,000	.63	....	
30,000	60,000	.73	....	
31,000	62,000	.80	....	
32,000	64,000	.90	....	
33,000	66,000	.98	....	
34,000	68,000	1.10	....	
35,000	70,000	1.22	....	
36,000	72,000	1.35	....	
37,000	74,000	1.50	....	
38,000	76,000	1.69	....	
39,000	78,000	1.90	....	
40,000	80,000	2.23	....	
41,000	82,000	2.55	....	
42,000	84,000	3.15	....	
42 500	85,000	3.95	....	
42,580	85,160	4.42	....	Tensile strength.
36,800	....	....	....	Load at time of rupture.
0	0	5.24	....	=17.5 per cent.

Elongation of inch sections: ″.13, ″.16, ″.18, ″.16, ″.19, ″.17, ″.20, ″.24, ″.44*, ″.26, ″.19, ″.19, ″.16, ″.16, ″.16, ″.16, ″.17, ″.16, ″.10, ″.17, ″.17, ″.15, ″.15, ″.15, ″.14, ″.14, ″.14, ″.13, ″.13, ″.13.

Diameter at fracture, ″.59. Area, .273 square inch. Contraction, 45.3 per cent.

Fractured 11″.70 from neck. Appearance, silky.

No. 757.

Marks, $\frac{5}{303}$
C, .51; Mn, .58; Si, .02.
Diameter, 1".0092.
Sectional area, .80 square inch.
Gauged length, 30".

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0.	0.	Initial load.
1,600	2,000	.0010	....	
2,400	3,000	.0020	....	
3,200	4,000	.0030	....	
4,000	5,000	.0040	.0001	
4,800	6,000	.0050	....	
5,600	7,000	.0061	....	
6,400	8,000	.0071	....	
7,200	9,000	....	....	
8,000	10,000	.0090	.0001	
8,800	11,000	....	....	
9,600	12,000	.0109	....	
10,400	13,000	....	....	
11,200	14,000	.0130	....	
12,000	15,000	.0140	.0001	
12,800	16,000	.0150	....	
13,600	17,000	....	....	
14,400	18,000	.0170	....	
15,200	19,000	....	....	
16,000	20,000	.0190	....	
16,800	21,000	.0201	.0001	
17,600	22,000	.0211	....	
19,200	24,000	.0231	....	
20,000	25,000	.0241	.0001	
20,800	26,000	.0251	....	
22,400	28,000	.0271	....	
24,000	30,000	.0291	.0001	

Bar rested six months, and stem turned down to ".798 diameter; =.50 square inch sectional area.

Total.	Per square inch.	Elongation.	Set.	Remarks.
500	1,000	....	.0001	
17,500	35,000	.0351	.0003	
20,000	40,000	.0401	.0004	
22,500	45,000	.0453	.0005	
25,000	50,000	.0506	.0006	
25,500	51,000	.0518	....	
26,000	52,000	.0528	....	
26,500	53,000	.0540	....	
27,000	54,000	.0551	....	
27,500	55,000	.0562	.0010	
27,750	55,500	.0571	....	
28,000	56,000	.0576	....	
28,250	56,500	.0581	....	
28,500	57,000	.0586	....	
28,750	57,500	.0598	....	
29,000	58,000	.0599	....	Elastic limit.
27,000	54,000	.0727	....	
27,500	55,000	.0940	....	
28,000	56,000	.19	....	
28,500	57,000	.28	....	
29,000	58,000	.31	....	
29,500	59,000	.33	....	
30,000	60,000	.35	....	
30,500	61,000	.37	....	
31,000	62,000	.40	....	
32,000	64,000	.45	....	
33,000	66,000	.50	....	
34,000	68,000	.57	....	
35,000	70,000	.63	....	
36,000	72,000	.70	....	
37,000	74,000	.75	....	
38,000	76,000	.82	....	
39,000	78,000	.92	....	
40,000	80,000	1.00	....	
41,000	82,000	1.10	....	

No. 759.

Marks, $\frac{7}{828}$
C, 71; Mn, .58; Si, .08.
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0.	0.	Initial load.
1,600	2,000	.0010		
2,400	3,000	.0020		
3,200	4,000	.0029		
4,000	5,000	.0039	0.	
4,800	6,000	.0049		
5,600	7,000	.0059		
6,400	8,000	.0069		
7,200	9,000	.0080		
8,000	10,000	.0090	0.	
12,000	15,000	.0140	0.	
16,000	20,000	.0190	.0001	
16,800	21,000	.0200	.0001	
20,000	25,000	.0240		
24,000	30,000	.0290		
24,800	31,000	.0300		
25,000	32,000	.0310		
26,400	33,000	.0320		
27,200	34,000	.0330		
28,000	35,000	.0340	.0001	
Bar rested one year.				
800	1,000	0.	0.	
28,800	36,000	.0351		
29,000	37,000	.0361		
30,400	38,000	.0371		
31,200	39,000	.0381		
32,000	40,000	.0391	.0002	
32,800	41,000	.0401		
33,600	42,000	.0411		
34,400	43,000	.0421		
35,200	44,000	.0432		
36,000	45,000	.0442	.0002	
36,800	46,000	.0451		
37,600	47,000	.0462		
38,400	48,000	.0473		
39,200	49,000	.0485		
40,000	50,000	.0496	.0004	
40,800	51,000	.0506		
41,600	52,000	.0517		
42,400	53,000	.0529		
43,200	54,000	.0542		Elastic limit.
44,000	55,000	.0559	.0014	
44,800	56,000	.0598		
45,600	57,000	.1540		
46,400	58,000	.1683		
47,200	59,000	.18		
48,000	60,000	.20		
49,600	62,000	.23		
51,200	64,000	.25		
52,800	66,000	.28		
54,400	68,000	.31		
56,000	70,000	.35		
57,600	72,000	.38		
59,200	74,000	.42		
60,800	76,000	.46		
62,400	78,000	.50		
64,000	80,000	.54		
65,600	82,000	.56		
67,200	84,000	.62		
68.800	86,000	.67		
70,400	88.000	.71		
72,000	90,000	.76		
73,600	92,000	.81		

No. 759—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
75,200	94,000	.86	....	
76,800	96,000	.92	....	
78,400	98,000	1.00	....	
80,000	100,000	1.07	....	
81,600	102,000	1.15	....	
83,200	104,000	1.23	....	
84,800	106,000	1.36	....	
86,400	108,000	1.46	....	
88,000	110,000	1.61	....	
89,600	112,000	1.89	....	
91,200	114,000	2.15	....	
92,800	116,000	2.48	....	
93,400	116,750	....	....	Tensile strength.
0	0	2.32	....	=7.7 per cent.

Fractured in the head at root of thread. Appearance, granular.

Elongation of inch sections: ″.07, ″.07, ″.08, ″.07, ″.07, ″.08, ″.08, ″.06, ″.09, ″.07, ″.09, ″.07, ″.09, ″07, ″.06, ″.07, ″.07, ″.07, ″.07, ″.06, ″.09, ″.08, ″.09, ″.07, ″.08, ″.09, ″08, ″.09, ″.07, ″.09.

Second bar marked $\frac{7}{823}$

C, .71; Mn, .58; Si, .08.
Diameter, ″.757.
Sectional area, .45 square inch.
Gauged length, 30″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
450	1,000	0.	0.	Initial load.
2,250	5,000	.0041	.0001	
4,500	10,000	.0092	.0001	
6,750	15,000	.0142	.0001	
9,000	20,000	.0192	.0002	
11,250	25,000	.0242	.0002	
13,500	30,000	.0295	.0005	
15,750	35,000	.0346	.0006	
18,000	40,000	.0398	.0008	
20,250	45,000	.0450	.0009	
22,500	50,000	.0501	.0009	
22,950	51,000	.0514	....	
23,400	52,000	.0525	....	
23,850	53,000	.0534	....	
24,300	54,000	.0547	....	
24,750	55,000	.0558	.0014	
25,200	56,000	.0572	....	
25,650	57,000	.0583	....	Elastic limit.
26,100	58,000	.0990	....	
26,550	59,000	.1620	....	
27,000	60,000	.1915	.1202 .1195	After fifteen hours' rest
27,900	62,000	.2075	....	
28,800	64,000	.2407	....	
29,700	66,000	.2738	....	
30,600	68,000	.30	....	
31,500	70,000	.35	....	
32,400	72,000	.38	....	
33,300	74,000	.42	....	
34,200	76,000	.46	....	
35,100	78,000	.51	....	
36,000	80,000	.55	....	
36,900	82,000	.58	....	
37,800	84,000	.63	....	

No. 759—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
38,700	86,000	.68	....	
39,600	88,000	.72	....	
40,500	90,000	.78	....	
41,400	92,000	.83	....	
42,300	94,000	.90	....	
43,200	96,000	.96	....	
44,100	98,000	1.02	....	
45,000	100,000	1.11	....	
45,900	102,000	1.18	....	
46,800	104,000	1.28	....	
47,700	106,000	1.41	....	
48,600	108,000	1.53	....	
49,500	110,000	1.68	....	
50,400	112,000	1.88	....	
51,300	114,000	2.23	....	
52,200	116,000	2.83	....	Tensile strength.
50,300	....	....	....	Load at time of rupture.
0	0	2.65	....	=8.8 per cent.

Elongation of inch sections: ''.07, ''.07, ''.09, ''.08, ''.08, ''.09, ''.09, ''.12, *''.22, ''.15, ''.08, ''.09, ''.09, ''.09, ''.08, ''.08, ''.08, ''.09, ''.08, ''.08, ''.10, ''.08, ''.08, ''.07, ''.08, ''.07, ''.07, ''.08, ''.08, ''.06.

Diameter at fracture, ''.65. Area, .332 square inch. Contraction, 26.2 per cent.

Fractured 10¾'' from neck. Appearance, granular; silky spot near center.

No. 760.

Marks, $\frac{8}{750}$
C, .81; Mn, .56; Si, .17.
Diameter, 1''.0092.
Sectional area, .80 square inch.
Gauged length, 30''.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0	0	Initial load.
1,600	2,000	.0010	....	
2,400	3,000	.0020	....	
3,200	4,000	.0030	....	
4,000	5,000	.0040	0	
4,800	6,000	.0049	....	
5,600	7,000	.0059	....	
6,400	8,000	.0070	....	
7,200	9,000	.0080	....	
8,000	10,000	.0090	0	
12,000	15,000	.0139	0	
16,000	20,000	.0191	....	
16,800	21,000	.0201	—.0001	
20,000	25,000	.0239	—.0001	
24,000	30,000	.0289	—.0001	
28,000	35,000	.0339	—.0001	
32,000	40,000	.0391	—.0001	
32,000	40,000	.0390	—.0001	
Bar rested one year, and stem turned down to ''.798 diameter=.50 square inch sectional area.				

No. 760—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
500	1,000	0.	0.	Initial load.
22,500	45,000	.0439	.0001	
25,000	50,000	.0490	.0001	
27,500	55,000	.0541	.0001	
30,000	60,000	.0600	.0002	
32,500	65,000	.0649	....	
33,000	66,000	.0661	....	
33,500	67,000	.0671	....	
34,000	68,000	.0684	....	
34,500	69,000	.0699	....	
35,000	70,000	.0713	.0014	Elastic limit.
35,500	71,000	.0734	....	
36,000	72,000	.0749	....	
36,500	73,000	.0773	....	
37,000	74,000	.0874	....	
37,500	75,000	.1090	....	
38,000	76,000	.1210	....	
38,500	77,000	.1352	....	
39,000	78,000	.1443	....	
39,500	79,000	.1547	....	
40,000	80,000	.1670	....	
41,000	82,000	.19	....	
42,000	84,000	.21	....	
43,000	86,000	.23	....	
44,000	88,000	.25	....	
45,000	90,000	.28	....	
46,000	92,000	.30	....	
47,000	94,000	.33	....	
48,000	96,000	.35	....	
49,000	98,000	.38	....	
50,000	100,000	.41	....	
51,000	102,000	.43	....	
52,000	104,000	.46	....	
53,000	106,000	.50	....	
54,000	108,000	.53	....	
55,000	110,000	.56	....	
56,000	112,000	.59	....	
57,000	114,000	.62	....	
58,000	116,000	.65	....	
59,000	118,000	.69	....	
60,000	120,000	.73	....	
61,000	122,000	.77	....	
62,000	124,000	.82	....	
63,000	126,000	.87	....	
64,000	128,000	.92	....	
65,000	130,000	.97	....	
66,000	132,000	1.02	....	
67,000	134,000	1.08	....	
68,000	136,000	1.15	....	
69,000	138,000	1.24	....	
70,000	140,000	1.32	....	
71,000	142,000	1.42	....	
72,000	144,000	1.52	....	
73,000	146,000	1.74	....	
74,000	148,000	1.96	....	
74,800	149,600	....	....	Tensile strength.
0.	0.	1.51	....	=5.0 per cent.

Fractured suddenly under the maximum load 1″ from the neck, at the center-punch mark defining the limit of the gauged length. Appearance, granular, radiating from the center-punch mark in the circumference.

Elongation of inch sections: ″.03, ″.05, ″.05, ″.04, ″.05, ″.05, ″.04, ″.05, ″.04, ″.05, ″.05, ″.04, ″.06, ″.05, ″.05, ″.05, ″.05, ″.05, ″.04, ″.06, ″.06, ″.05, ″.05, ″.06, ″.06, ″.06, ″.06, ″.06, ″.06, ″.04.

Diameter at fracture, ″.776. Area, .473 square inch. Contraction of area, 5.4 per cent.

No. 761.

Marks, $\frac{9}{756}$.
C, .89; Mn, .57; Si, .19.
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0.	0.	Initial load.
1,600	2,000	.0010	....	
2,400	3,000	.0020	....	
3,200	4,000	.0030	....	
4,000	5,000	.0040	0.	
4,800	6,000	.0050	....	
5,600	7,000	.0060	....	
6,400	8,000	.0070	....	
7,200	9,000	.0081	....	
8,000	10,000	.0091	.0001	
12,000	15,000	.0141	.0001	
16,000	20,000	.0192	....	
16,800	21,000	.0202	.0002	
20,000	25,000	.0242	.0002	
24,000	30,000	.0292	.0002	
28,000	35,000	.0342	.0003	
32,000	40,000	.0393	.0003	
32,800	41,000	.0404	....	
33,600	42,000	.0414	....	
34,400	43,000	.0424	....	
35,200	44,000	.0436	....	
36,000	45,000	.0445	.0003	
36,000	45,000	.0446	.0004	
36,000	45,000	.0446	....	
32,000	40,000	.0395	....	
28,000	35,000	.0345	....	
24,000	30,000	.0295	....	
20,000	25,000	.0245	....	
16,000	20,000	.0195	....	
12,000	15,000	.0145	....	
8,000	10,000	.0095	....	
4,000	5,000	.0044	....	
800	1,000	.0004	....	

Bar rested one year, and stem turned down to ″.757 diameter =.45 square inch sectional area.

Total.	Per square inch.	Elongation.	Set.	Remarks.
450	1,000	0.	0.	Initial load.
22,500	50,000	.0495	.0001	
24,750	55,000	.0514	.0001	
27,000	60,000	.0595	.0001	
29,250	65,000	.0648	.0001	
29,700	66,000	.0658	....	
30,150	67,000	.0669	....	
30,600	68,000	.0680	....	
31,050	69,000	.0689	....	
31,500	70,000	.0698	.0001	
31,950	71,000	.0710	....	
32,400	72,000	.0720	....	
32,850	73,000	.0730	....	
33,300	74,000	.0740	....	
33,750	75,000	.0750	.0002	Elastic limit.
34,200	76,000	.0769	....	
34,650	77,000	.0782	....	
35,100	78,000	.0797	....	
	76,000	.1100	....	
	77,000	.1164	....	
	78,000	.2295	....	
35,550	79,000	.24	....	
36,000	80,000	.26	....	
36,900	82,000	.27	....	
37,800	84,000	.29	....	
38,700	86,000	.31	....	
39,600	88,000	.34	....	
40,500	90,000	.37	....	
41,400	92,000	.40	....	
42,300	94,000	.42	....	

No. 761—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
43, 200	96, 000	.45	....	
44, 100	98, 000	.48	....	
45, 000	100, 000	.52	....	
45, 900	102, 000	.55	....	
46, 800	104, 000	.58	....	
47, 700	106, 000	.63	....	
48, 600	108, 000	.68	....	
49, 500	110, 000	.72	....	
50, 400	112, 000	.76	....	
51, 300	114, 000	.79	....	
52, 200	116, 000	.82	....	
53, 100	118, 000	.87	....	
54, 000	120, 000	.91	....	
54, 900	122, 000	.95	....	
55, 800	124, 000	.99	....	
56, 700	126, 000	1. 05	....	
57, 600	128, 000	1. 12	....	
58, 500	130, 000	1. 18	....	
59, 400	132, 000	1. 26	....	
60, 300	134, 000	1. 33	....	
61, 200	136, 000	1. 45	....	
62, 100	138, 000	1. 55	....	
63, 000	140, 000	1. 73	....	
63, 580	141, 290	....	....	Tensile strength.
0.	0.	1. 30	....	=4.3 per cent.

Fractured suddenly under the maximum load at a distance of 1″ from the neck, at the center-punch mark defining the extremity of the gauged length. Appearance, granular, radiating from the punch mark in the circumference of the fractured surface.

Diameter of fracture, ″.74. Area, .43 square inch. Contraction, 4.4 per cent.

Elongation of inch sections: ″.04, ″.05, ″.04, ″.04, ″.05, ″.04, ″.04, ″.04, ″.04, ″.04, ″.05, ″.04, ″.05, ″.04, ″.05, ″.04, ″.04, ″.04, ″.04, ″.04, ″.03, ″.04, ″.04, ″.04, ″.06, ″.05, ″.05, ″.05, ″.05, ″.04.

No. 762.

Marks, $\frac{10}{834}$
C, .97; Mn, ".80; Si, 28.
Diameter, 1".0092.
Sectional area, .80 square inch.
Gauged length, ".30.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
800	1,000	0.	0.	**Initial load.**
1,600	2,000	.0009	....	
2,400	3,000	.0018	....	
3,200	4,000	.0028	....	
4,000	5,000	.0037	0.	
4,800	6,000	.0047	....	
5,600	7,000	.0057	....	
6,400	8,000	.0067	....	
7,200	9,000	.0078	....	
8,000	10,000	.0088	0.	
12,000	15,000	.0138	0.	
16,000	20,000	.0190	....	
16,800	21,000	.0201	0.	
20,000	25,000	.0240	0.	
24,000	30,000	.0290	0.	
28,000	35,000	.0341	.0002	
32,000	40,000	.0393	.0003	
36,000	45,000	.0447	.0003	
36,800	46,000	.0457	....	
37,600	47,000	.0467	....	
38,400	48,000	.0477	....	
39,200	49,000	.0487	....	
40,000	50,000	.0497	.0004	
40,000	50,000	.0497	....	
36,000	45,000	.0448	....	
32,000	40,000	.0396	....	
28,000	35,000	.0346	....	
24,000	30,000	.0296	....	
20,000	25,000	.0247	....	
16,000	20,000	.0198	....	
12,000	15,000	.0145	....	
8,000	10,000	.0095	....	
4,000	5,000	.0044	....	
800	1,000	.0005	....	**Rested one hour.**
800	1,000	.0008	....	
4,000	5,000	.0047	....	
8,000	10,000	.0097	....	
12,000	15,000	.0148	....	
16,000	20,000	.0200	....	
20,000	25,000	.0248	....	
24,000	30,000	.0298	....	
28,000	35,000	.0348	....	
32,000	40,000	.0398	....	
36,000	45,000	.0450	....	
40,000	50,000	.0500	....	
36,000	45,000	.0452	....	
32,000	40,000	.0400	....	
28,000	35,000	.0350	....	
24,000	30,000	.0299	....	
20,000	25,000	.0249	....	
16,000	20,000	.0200	....	
12,000	15,000	.0149	....	
8,000	10,000	.0098	....	
4,000	5,000	.0048	....	
800	1,000	.0008	....	
Bar rested one year and stem turned down to ".797 diameter = .45 square inch sectional area.				
450	1,000	0.	0.	**Initial load.**
24,750	55,000	.0550	.0008	
27,000	60,000	.0602	.0007	
29,250	65,000	.0652	.0007	
31,500	70,000	.0707	.0008	
33,750	75,000	.0764	.0015	
34,200	76,000	.0779	....	

No. 762—Continued.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
34,650	77,000	.0790	....	
35,100	78,000	.0802	....	
35,550	79,000	.0815	....	Elastic limit.
36,000	80,000	.0834	.0030	
36,450	81,000	.1100	....	
36,900	82,000	.1695	....	
37,350	83,000	.1750	....	
37,800	84,000	.1855	....	
38,250	85,000	.1920	....	
38,700	86,000	.1944	....	
39,150	87,000	.2130	....	
39,600	88,000	.2263	....	
40,050	89,000	.2353	....	
40,500	90,000	.2475	....	
41,400	92,000	.2735	....	
42,300	94,000	.28	....	
43,200	96,000	.30	....	
44,100	98,000	.34	....	
45,000	100,000	.36	....	
45,900	102,000	.39	....	
46,800	104,000	.41	....	
47,700	106,000	.45	....	
48,600	108,000	.48	....	
49,500	110,000	.51	....	
50,400	112,000	.53	....	
51,300	114,000	.56	....	
52,200	116,000	.59	....	
53,100	118,000	.63	....	
54,000	120,000	.67	....	
54,900	122,000	.70	....	
55,800	124,000	.74	....	
56,700	126,000	.78	....	
57,600	128,000	.83	....	
58,500	130,000	.88	....	
59,400	132,000	.93	....	
60,300	134,000	.98	....	
61,200	136,000	1.03	....	
62,100	138,000	1.08	....	
63,000	140,000	1.15	....	
63,900	142,000	1.20	....	
64,800	144,000	1.29	....	
65,700	146,000	1.40	....	
66,600	148,000	1.51	....	
67,500	150,000	1.65	....	
68,400	152,000	1.83	....	
68,650	152,550	....	....	Tensile strength.
0	0	1.30	....	= 4.3 per cent.

Fractured 1″ from neck, at center-punch mark defining one extremity of the gauged length. Appearance, granular, radiating from the punch mark in the circumference.

Elongation of inch sections: ″.03, ″.05, ″.04, ″.02, ″.04, ″.03, ″.04, ″04, ″.03, ″.05, ″.04, ″.04, ″.05, ″.03, ″.05, ″.04, ″.05, ″.05, ″.04, ″.04, ″.05, ″.05, ″.05, ″.04, ″.05, ″.05, ″.05, ″.06, ″.06, ″.04.

Diameter at fracture, ″.735. Area, .424 square inch. Contraction, 5.8 per cent.

THE ULTIMATE CRUSHING STRENGTH AND COLD FLOW OF STEEL AND IRON CYLINDERS.

Cylinders were prepared 2″ long by ″.798 diameter, with flat ends, and subjected to compression loads in a direction parallel to their axes, the sides of the cylinders being unsupported.

The loads were increased by regular increments, and the lengths and diameters of the cylinders measured after each load had been applied and allowed to act a sufficient length of time to produce substantially its full effect on the metal.

The diameters measured at the middle of the lengths of the cylinders are the recorded ones unless otherwise stated in the details of the test, and were the diameters used for computing the sectional areas.

Contrary to the practice observed in the ordinary tension and compression tests of referring the loads to the primitive section, in these crushing and cold-flow tests the loads per square inch are stated for the areas of the cylinders as they existed at the time the loads were acting, using the middle diameters in computing the sectional areas.

The ends of the cylinders in contact with the rigid platforms of the testing machine were smallest in diameters, while the maximum diameters were found at the middle of their lengths after the flow of metal had continued for a time, although shortly after passing the elastic limit of the metal the maximum diameters were found about ½″ from the ends of the specimens, the metal here being from ″.001 to .″007 larger than the middle diameter.

In the case of the steel cylinders the loads per square inch gradually increased, while the cylinders were shortened amounts ranging between ″.40 and ″.75, then the pressure per square inch remained practically constant, while the cylinders were shortened the additional amounts of ″.26 to ″.67 in the different specimens.

The loads which thus continued the flow are regarded as representing the ultimate crushing resistance of the metal.

When the more ductile specimens had been reduced in length to ″.7 or ″.8 there was a marked increase in their resistance, and as higher loads were reached before there was visible evidence of disintegration, this probably marked the time when the flow of the metal was interfered with by that part which was in direct contact with the rigid platforms of the testing machines. If such be the true explanation, then ″.35 to ″.40 marks the limit of re-enforcement of the metal by reason of its contact with the testing machine, beyond which distance uninterrupted flow may take place.

The harder grades of steel are not capable of enduring so great displacement, and cracks open before they are reduced in length so much as the milder specimens.

Some of the cracks are parallel to the axes of the specimens, indicating fractures by tension; generally oblique or shearing fractures predominate.

There is comparatively little radial flow of the metal immediately at the ends of the cylinders, as shown by the diameters scored on the end of cylinder 6 retaining their dimensions so well.

There was a notable reduction in the resistance of cylinder No. 8 when shortened below the length 1″.20, unaccompanied by any outward cracks until reduced to ″.88 long.

The very singular fact is shown that in specimens Nos. 1 to 5, inclusive, the tensile strength measured on the reduced section at the time of rupture exceeds in pounds per square inch the ultimate crushing resistance of the corresponding grades of metal.

Different periods of rest following loads which exceeded the elastic limit of the steel bars did not occasion appreciable interruption to the flow of the metal when the tests were resumed.

Interrupting the test of the annealed wrought-iron cylinder and allowing a period of rest was followed by a decided increase of resistance.

The metal at the ends of the cylinders flowed into small cavities in the surface of the compression platforms, although the drilled and reamed centers on which the specimens finished were not obliterated by the test.

A second cylinder No. 1 had a concentric hole ″.08 diameter drilled through it. The cylinder was shortened to ″.75 long, the hole at the ends remaining large enough to allow the drill to pass freely through it. At the middle of the length of the cylinder it was enlarged. The metal then showed signs of disintegration. Continuing the pressure and shortening the cylinder to ″.40 long developed tension and shearing fractures in the bulged surface and slightly diminished the diameter of the drilled hole.

A special experiment was made with a bar 5″ long of the steel marked 10—334.

The bar was turned 1″.20 diameter and reduced at the middle to ″.505, connecting the middle section with the ends with easy ogee curves.

It was heated bright red and quenched in brine, hardening the reduced section so that a file would not scratch it. The specimen was compressed with the following results:

Sectional area, reduced section, ″.20 square inch.

Applied loads.		Diameter.	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inch.*	
0	0	.505	
80,000	400,000	.510	
90,000	450,000	.511	
100,000	500,000	.512	
120,000	600,000	.518	Ultimate strength.

Under the maximum load the specimen fractured across the middle with a slight report; the fractured surface was inclined 8 degrees from a plane normal to the line of pressure.

Fine longitudinal cracks opened in the middle section and also in the neck, where the diameter was ″.90.

DETAILS OF CRUSHING TESTS AND COLD FLOW OF STEEL AND IRON CYLINDERS.

No. 979.

Marks, 1–833.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
22,000	1.98	.80−	.50	44,000	
26,000	1.95	.80+	.50	52,000	
30,000	1.92	.81	.515	58,250	
35,000	1.85	.83	.541	64,690	
40,000	1.76	.85	.567	70,550	
45,000	1.66	.87	.594	75,760	
		.86	.581	....	End diameter.
50,000	1.56	.90	.636	78,630	
		.86	.581	....	Do.
55,000	1.47	.93	.679	81,000	
		.92	.665	....	Do.
60,000	1.38	.96	.724	82,870	
		.91	.650	....	Do.
65,000	1.30	1.00	.785	82,800	
		.96	.724	....	Do.
70,000	1.24	1.03	.833	84,030	
		.95	.709	....	Do.
75,000	1.17	1.06	.882	85,080	
		1.01	.801	....	Do.
80,000	1.11	1.10	.950	84,210	
		1.00	.785	....	Do.
85,000	1.05	1.14	1.021	83,250	
		1.06	.882	....	Do.
90,000	1.00	1.16	1.057	85,150	
		1.05	.866	....	Do.
95,000	.95	1.20	1.131	84,000	
		1.12	.985	....	Do.
100,000	.92	1.23	1.188	84,180	
		1.10	.950	....	Do.
105,000	.87	1.25	1.227	85,580	
		1.16	1.057	....	Do.
110,000	.83	1.28	1.287	85,470	
		1.15	1.039	....	Do.
115,000	.81	1.30	1.327	86,600	
		1.21	1.150	....	Do.
120,000	.77	1.32	1.368	87,720	
		1.20	1.131	....	Do.
125,000	.76	1.34	1.410	88,650	
130,000	.74	1.35	1.431	90,850	
135,000	.72	1.38	1.496	90,240	
140,000	.71	1.40	1.539	90,970	
145,000	.68	1.42	1.584	91,540	
150,000	.66	1.43	1.606	93,400	
160,000	.64	1.46	1.674	95,580	
180,000	.58	1.52	1.814	99,230	
		1.46	1.674	....	Do.
200,000	.55	1.58	1.961	101,990	
		1.40	1.539	....	Do.

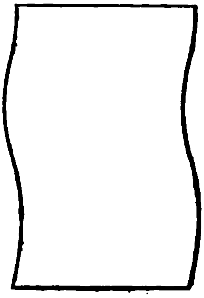
Cracks showed at circumference under 135,000 pounds pressure.

After discontinuing the test the largest crack was open ″.02; other cracks only showed as lines on the surface.

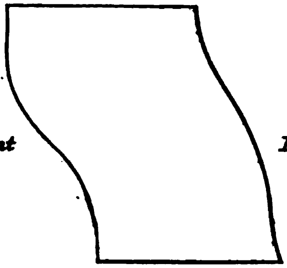
No. 989.

Marks, 2–123.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inch.*		
0	2.00	.798	.50	0	
30,000	1.98	.803	.506	59,290	
35,000	1.95	.810	.515	67,960	
40,000	1.90	.819	.527	75,900	
45,000	1.84	.834	.546	82,420	
50,000	1.76	.82 .853 .82	.528 .571 .528	87,570	
55,000	1.68	.84 .8758 .8750 .8759 .84	.601	91,510	
60,000	1.60	.900	.636	94,340	
62,500	1.55	.912	.653	95,710	
65,000	1.48	.931	.681	....	Rested ½ hour.
67,500	1.47	.937	.690	....	

Present

Form.

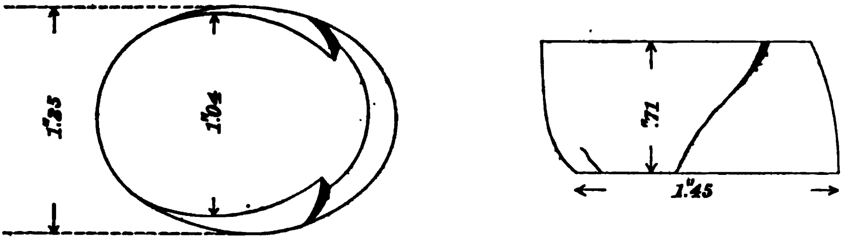
70,000	1.41	.952	.711	....	
72,500	1.37	.965	.731	99,180	
75,000	1.32	.92 .979 .92	.665 .758 .665	....	

Present

Form.

77,500	1.20	1.01	.801	....	
80,000	1.14	1.04	.849	....	
85,000	1.04	1.07	.899	....	
90,000	.98	1.10	.950	94,740	
95,000	.94	1.11	.968	....	
100,000	.90	1.12	.985	....	
110,000	.84	....	....	....	
120,000	.79	....	....	....	
150,000	....	....	....	....	Sustained momentarily.

An oblique fracture nearly separated the specimen.

Form of specimen after the test.



No. 981.

Marks, 2–123.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
30,000	1.96	.809	.514	58,370	
35,000	1.94	814	.520	67,310	
40,000	1.89	.825	.535	74,770	
45,000	1.83	.840	.554	81,230	
50,000	1.755	.859	.580	86,210	
		.84	.554	....	End diameter.
55,000	1.68	.880	.608	90,460	
		.84	.551	....	Do.
60,000	1.59	.904	.642	93,460	
65,000	1.52	.930	.679	95,730	
70,000	1.44	.956	.718	97,490	
75,000	1.37	.983	.759	98,810	
80,000	1.31	1.009	.799	100,120	
85,000	1.245	1.037	.844	100,710	
90,000	1.19	1.064	.889	101,240	
95,000	1.13	1.096	.943	100,740	
100,000	1.08	1.123	.990	101,010	
105,000	1.04	1.148	1.035	101,450	
110,000	1.005	1.173	1.081	101,760	
115,000	.96	1.197	1.125	102,220	
120,000	.94	1.220	1.169	102,650	
0	....	....	....	....	Rested forty hours.
120,000	.935	1.221	1.171	102,480	
125,000	.912	1.234	1.196	104,520	
130,000	.87	1.259	1.245	104,420	
135,000	.85	1.278	1.283	105,220	
140,000	.83	1.323	1.374	101,890	
150,000	.78	1.332	1.393	107,680	
160,000	.75	1.366	1.450	110,340	
170,000	.71	1.401	1.542	110,250	Fine cracks in bulged surface.
180,000	.68	1.42	1.58	113,920	
190,000	.64	1.45	1.65	115,150	
200,000	.62	1.48	1.72	116,280	Cracks open wider.
220,000	.57	1.54	1.86	118,280	Numerous oblique cracks in bulged surface.
		1.36	....	....	End diameter.
0	.575	1.54	1.86	0	
		1.39	....	....	Do.

Cracks make angles of 45° ± with compressed end surfaces of cylinder.

No. 982.

Marks, 3–782

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
30,000	1.99	.800	.503	59,640	
35,000	1.965	.805	.509	68,760	
40,000	1.94	.811	.517	77,370	
45,000	1.90	.819	.527	85,390	
50,000	1.86	.830	.541	92,420	
55,000	1.79	.845	.561	98,040	
60,000	1.71	.866	.589	101,870	
65,000	1.63	.888	.619	104,960	
70,000	1.56	.908	.648	108,020	
75,000	1.495	.928	.676	110,950	
80,000	1.43	.951	.710	112,680	
85,000	1.37	.976	.648	113,640	
90,000	1.31	1.001	.787	114,360	
95,000	1.26	1.025	.825	115,150	
100,000	1.20	1.051	.868	115,210	
25,000	....	....	....	....	Rested eighteen hours.
100,000	1.205	1.050	.866	115,470	
105,000	1.17	1.070	.899	116,790	
110,000	1.10	1.102	.953	115,420	
115,000	1.065	1.125	.994	115,690	
120,000	1.02	1.158	1.044	114,940	
125,000	.99	1.174	1.082	115,530	
130,000	.95	1.197	1.125	115,560	
135,000	.92	1.217	1.163	116,080	
140,000	.89	1.237	1.202	116,470	
150,000	.845	1.274	1.275	117,650	
160,000	.795	1.308	1.344	119,050	
170,000	.76	1.338	1.406	120,910	
180,000	.72	1.18 1.368 1.18	1.094 1.469 1.094	.... 122,530	End diameter. Do.
190,000	.685	1.40	1.539	123,460	
200,000	.65	1.44	1.629	122,770	Cracks in bulged surface.

The cracks made angles of 45° ± with the compressed ends.

No. 983.

Marks, 4–795.

Applied loads.	Dimensions. Length.	Dimensions. Diameter.	Sectional area.	Pounds per square inch.	Remarks.
Pounds.	*Inches.*	*Sq. inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
35,000	1.98	.803	.506	69,170	
40,000	1.955	.808	.513	77,970	
45,000	1.92	.815	.522	86,210	
50,000	1.88	.825	.535	93,460	
55,000	1.82	.837	.550	100,000	
60,000	1.76	.854	.573	104,700	
65,000	1.68	.873	.599	108,510	
70,000	1.615	.893	.626	111,820	
75,000	1.545	.913	.655	114,500	Fine longitudinal lines (cracks) in cylindrical surface.
80,000	1.485	.934	.685	116,790	
		.89	.622	....	
85,000	1.42	.958	.721	117,890	Slight tendency to buckle.
		.89	.622	....	
90,000	1.36	.980	.754	119,360	
95,000	1.31	1.003	.790	120,250	
100,000	1.26	1.026	.826	121,070	
105,000	1.21	1.049	.864	121,530	
110,000	1.16	1.073	.904	121,680	No enlargement of surface lines.
115,000	1.11	1.101	.952	120,790	
120,000	1.07	1.125	.994	120,730	
125,000	1.025	1.148	1.035	120,770	
130,000	.99	1.171	1.077	120,710	
135,000	.96	1.192	1.116	121,070	
140,000	.93	1.213	1.155	121,210	
145,000	.895	1.232	1.192	121,640	
150,000	.88	1.252	1.231	121,850	
155,000	.845	1.268	1.263	122,720	
160,000	.83	1.287	1.301	122,980	
170,000	.79	1.318	1.364	124,630	
180,000	.76	1.346	1.423	126,490	
		1.20	1.181	....	End diameter.
190,000	.72	1.373	1.480	128,380	Longitudinal surface cracks opening slightly.
		1.20	1.131	....	
200,000	.68	1.40	1.539	129,960	
210,000	.64	1.445	1.640	128,050	Longitudinal surface cracks open rapidly, and oblique cracks formed.
		1.32	1.368	....	End diameter.
220,000	.62	1.49	1.744	126,150	
		1.31	1.348	....	Do.

The oblique fractures are at an angle of 45° with surface of ends.
The longitudinal fractures show silky metal.

No. 984.

Marks, 5–803.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
35,000	1.995	.799	.501	69,860	
40,000	1.99	.801	.504	79,370	
45,000	1.965	.806	.510	88,240	
50,000	1.935	.813	.519	96,340	
55,000	1.905	.820	.528	104,170	
60,000	1.86	.830	.541	110,910	
65,000	1.805	.843	.558	116,490	
70,000	1.735	.860	.581	120,480	
75,000	1.675	.878	.605	123,970	
		.86	....	....	End diameter.
		.900	....	....	¼" from end.
80,000	1.60	.898	.643	124,380	
		.902	....	....	¼" from end.
		.86	....	....	End diameter.
85,000	1.54	.918	.662	128,400	
90,000	1.48	.938	.691	130,250	
95,000	1.425	.958	.721	131,760	
100,000	1.37	.979	.753	132,800	
105,000	1.325	1.001	.787	133,420	
110,000	1.285	1.022	.820	134,150	
115,000	1.225	1.048	.862	133,410	
25,000	....	....	....	....	Rested five hours.
120,000	1.175	1.070	.899	133,480	
125,000	1.14	1.094	.939	133,120	
130,000	1.08	1.126	.996	130,520	
135,000	1.04	1.147	1.034	130,560	
140,000	1.005	1.170	1.075	130,230	
145,000	.98	1.187	1.107	130,980	
150,000	.94	1.209	1.148	130,660	
155,000	.915	1.226	1.180	131,360	
160,000	.89	1.243	1.213	131,900	
170,000	.845	1.277	1.281	132,710	
180,000	.81	1.306	1.340	134,330	
190,000	.785	1.331	1.391	136,590	
200,000	.745	1.357	1.446	138,310	
210,000	.710	1.375	1.485	141,410	
220,000	.685	1.40	1.539	142,950	
240,000	.64	1.445	1.640	146,340	
260,000	.60	1.49	1.744	149,080	
		1.36	....	....	End diameter.
300,000	....	1.55	1.887	158,980	
		1.36	....	....	Do.

Opened oblique (45°) cracks in bulged surface under the maximum pressure.

No. 985.

Marks, 6–797.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
40,000	1.99	.799	.501	79,840	
45,000	1.98	.801	.504	89,290	
50,000	1.965	.804	.508	98,430	".324 diameter ".55 diameter ".76 diameter } Circular lines scored on one end.
55,000	1.955	.807	.511	107,630	
60,000	1.935	.812	.518	115,830	
65,000	1.91	.817	.524	124,050	
70,000	1.87	.825	.535	130,840	
75,000	1.835	.836	.549	136,610	
80,000	1.78	.848	.565	141,590	
85,000	1.71	.867	.590	144,070	
90,000	1.655	.883	.612	147,060	Rested fifteen minutes.
95,000	1.585	.901	.638	148,900	
100,000	1.530	.923	.669	149,480	
105,000	1.475	.936	.688	152,620	
110,000	1.425	.954	.715	153,850	
115,000	1.375	.973	.744	154,570	
120,000	1.330	{ .90 .993 .90	.774	155,040	".336 ".577 ".806 } Diameters of scored circular lines.
125,000	1.285	1.013	.806	155,090	
130,000	1.245	1.028	.830	156,630	
135,000	1.205	1.047	.861	156,790	
140,000	1.17	1.067	.894	156,600	
145,000	1.13	1.084	.923	157,100	
150,000	1.085	1.109	.966	155,280	
155,000	1.055	1.124	.992	156,250	
160,000	1.025	1.141	1.023	156,400	Sustained one hour, load falling to 140,000 in the mean time.
165,000	1.005	1.154	1.046	157,740	
170,000	.965	1.176	1.086	156,540	
180,000	.92	1.207	1.144	157,340	
190,000	.875	1.237	1.202	158,070	
200,000	.835	1.267	1.261	158,600	
205,000	....	....	....	....	
	Opened oblique (45°) fractures in bulged surface under the maximum load.				
0	.83	{ 1.08 1.287 1.11	1.301	....	".34 ".59 ".82 } Diameters of scored circular lines.

NOTE.—The lengths recorded in this test are approximately measured, on account of the specimen sinking into the compression platforms.

No. 986.

Marks, 7–823.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
		.801			Diameter ¼ length.
40,000	1.095	.799	.501	79,840	
		.801			Diameter ¾ length.
45,000	1.99	.801	.504	89,290	
50,000	1.98	.804	.508	98,430	
55,000	1.965	.808	.513	107,210	
60,000	1.95	.811	.517	116,050	
65,000	1.925	.817	.524	124,050	
70,000	1.88	.825	.535	130,840	
75,000	1.84	.836	.549	136,610	
80,000	1.785	.849	.566	141,340	
85,000	1.72	.867	.590	144,070	
90,000	1.66	.881	.610	147,540	
95,000	1.595	.900	.636	149,370	
100,000	1.535	.918	.662	151,060	
105,000	1.48	.936	.688	152,620	
110,000	1.43	.954	.715	153,850	
115,000	1.385	.973	.744	154,570	
120,000	1.34	.989	.768	156,250	
125,000	1.29	1.011	.806	155,090	
130,000	1.25	1.029	.832	156,250	
135,000	1.215	1.047	.861	156,800	
140,000	1.18	1.066	.893	156,770	
145,000	1.14	1.085	.925	156,760	
150,000	1.095	1.112	.971	154,480	
155,000	1.06	1.126	.996	155,620	
160,000	1.035	1.145	1.030	155,340	
165,000	1.01	1.162	1.061	155,510	
170,000	.985	1.177	1.088	156,250	
180,000	.93	1.212	1.154	155,980	
190,000	.89	1.243	1.213	156,640	
200,000	.845	1.270	1.267	157,850	
205,000					Maximum load.
Opened oblique (45°) fractures, part of one fracture being parallel to axis of specimen.					
		1.09			End diameter.
0	.84	1.290	1.307		
		1.10			Do.

No. 987.

Marks, 8–750.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
45,000	1.997	.799	.501	89,820	
50,000	1.997	.7995	.502	99,600	
55,000	1.996	.800	.503	109,340	
60,000	1.99	.801	.504	119,050	
65,000	1.98	.803	.506	128,460	
70,000	1.967	.805	.509	137,520	
75,000	1.96	.8075	.512	146,480	
80,000	1.94	.8105	.516	155,040	
85,000	1.92	.815	.522	162,840	
90,000	1.90	.821	.529	170,130	
95,000	1.865	.8295	.540	175,930	
100,000	1.815	.840	.554	180,510	
105,000	1.760	.854	.573	183,250	
110,000	1.71	.868	.592	185,810	
115,000	1.65	.883	.612	187,910	
		.903	.640	....	Diameter ¼ length.
120,000	1.695	.898	.633	189,570	Diameter ½ length.
		.905	.643	....	Diameter ¾ length.
125,000	1.55	.912	.653	191,420	
130,000	1.51	.926	.673	193,160	
135,000	1.465	.941	.695	194,240	
140,000	1.415	.960	.724	193,370	
145,000	1.38	.978	.744	194,890	
150,000	1.34	.988	.767	195,570	
155,000	1.30	1.005	.793	195,460	
160,000	1.27	1.021	.819	195,360	
170,000	1.20	1.050	.866	196,300	
180,000	1.08	1.109	.966	186,340	
190,000	1.03	1.140	1.021	186,090	
200,000	.98	1.169	1.073	186,390	
210,000	.94	1.196	1.123	187,000	
220,000	.88	1.233	1.194	184,250	

Sustained 220,000 pounds ½ minute and then opened oblique (45°) cracks with slight report.

The resistance of the cylinder now fell to about 200,000 pounds, while the oblique shearing fractures opened; after which the total load was increased to 250,000 pounds, when the test was discontinued.

Length of specimen after the test, ″.75.

No. 988.

Marks, 9–756.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter?			
Pounds.	*Inches.*	*Inch.*	*Sq. Inches.*		
0	2.00	.796	.50	0	
55,000	1.995	.800	.503	109,340	
60,000	1.985	.803	.506	118,580	
65,000	1.975	.805	.509	127,700	
70,000	1.96	.807	.511	136,990	
75,000	1.95	.810	.515	145,630	
80,000	1.925	.814	.520	153,850	
85,000	1.90	.821	.529	160,680	
90,000	1.865	.828	.538	167,290	
95,000	1.815	.841	.555	171,170	
100,000	1.77	.852	.570	175,440	
105,000	1.71	.868	.592	177,360	
110,000	1.65	.883	.612	179,740	
115,000	1.60	.899	.635	181,100	
120,000	1.55	.912	.653	183,770	
125,000	1.50	.931	.681	183,560	
130,000	1.455	.945	.701	185,450	
135,000	1.41	.961	.725	186,210	
140,000	1.375	.978	.751	186,420	
145,000	1.335	.993	.774	187,340	
150,000	1.29	1.010	.801	187,270	
155,000	1.26	1.024	.824	188,110	
160,000	1.225	1.043	.854	187,350	
170,000	1.15	1.060	.916	185,590	
180,000	1.09	1.113	.973	185,000	
190,000	1.035	1.144	1.028	184,820	
200,000	.985	1.174	1.082	184,840	
210,000	.93	1.208	1.146	183,250	

Sustained 210,000 pounds ¼ minute, then opened oblique (45°±) shearing fractures in the bulged surface. In part the fractures were parallel to the axis of the specimen; these latter ones presented dull colored serrated surfaces.

No. 989.

Marks, 10–334.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
60,000	1.99	.802	.505	118,810	
65,000	1.985	.804	.508	127,950	
70,000	1.97	.806	.510	137,250	
75,000	1.965	.808	.513	146,200	
80,000	1.95	.811	.517	154,730	
85,000	1.93	.816	.523	162,520	
90,000	1.90	.822	.531	169,490	
95,000	1.86	.831	.542	175,280	
100,000	1.815	.843	.558	179,210	
Rested sixteen hours, the total pressure in the mean time falling from 100,000 pounds to 62,000 pounds.					
105,000	1.77	.854	.573	183,250	
110,000	1.70	.873	.599	183,640	
115,000	1.64	.890	.622	184,890	Cylinder deflected at middle.
120,000	1.59	.904	.642	186,920	
125,000	1.54	.919	.663	188,540	
130,000	1.49	.937	.690	188,410	
135,000	1.45	.952	.712	189,610	
140,000	1.41	.968	.736	190,220	
145,000	1.37	.984	.760	190,790	
150,000	1.33	.996	.779	192,550	
155,000	1.29	1.010	.801	193,510	
160,000	1.25	1.025	.825	193,940	
170,000	1.19	1.057	.878	193,620	
180,000	1.12	1.092	.937	192,100	
190,000	1.05	1.122	.984	193,090	
200,000	1.02	1.144	1.028	194,550	
208,000	1.00	1.162	1.060	196,230	

Opened oblique cracks under the maximum load in the bulged surface.

The pressure was continued till the dimensions were: Length, ″.85; diameter, 1″.30; the loads varying between 190,000 and 208,000 pounds; the widest crack now opening to ″.20.

The oblique cracks presented smooth shearing fractures. Where the cracks approached a direction parallel to the axis of the cylinder the surfaces were dull silky and serrated.

No. 1005.

CAST IRON.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inch.*	*Sq. inch.*		
0	2.00	.798	.50	0	
20,000	2.00	.7995	.502	39,840	
25,000	1.995	.8015	.504	49,600	
30,000	1.98	.8035	.507	59,170	
35,000	1.975	.806	.510	68,620	
40,000	1.96	.8095	.515	77,670	
45,000	1.935	.8145	.521	86,370	
50,000	1.905	.824	.533	93,810	
55,000	1.825	.853	.571	96,320	
56,500	1.775	.875	.601	94,010	

Cylindrical surface broken up by numerous fine cracks.

The principal fracture an oblique crack, making an angle of 35° with the axis of cylinder.

Wrought iron from specimen marked "8 H & P Best," material used in chain cables.

See tensile tests Nos. 1901 and 1902, page , Report of Tests, 1886.

No. 1006.

UNANNEALED SPECIMEN FROM FRACTURED BAR, TAKEN 2 INCHES FROM POINT OF RUPTURE.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798+	.50	0	
20,000	2.00	.798+	.50	40,000	
25,000	2.00	.798+	.50	50,000	
30,000	1.99	.800	.503	59,640	
32,500	1.985	.8025	.506	64,230	
35,000	1.96	.8075	.512	68,360	
37,500	1.925	.8150	.522	71,840	
40,000	1.875	.827	.537	74,490	
42,500	1.825	.840	.554	76,710	
45,000	1.775	.852	.570	78,950	
47,500	1.73	.863	.585	81,200	
50,000	1.695	.873	.599	83,470	
52,500	1.665	.879	.607	86,490	
55,000	1.63	.890	.622	88,430	
60,000	1.545	.918	.662	90,630	
65,000	1.455	.952	.712	91,290	
70,000	1.37	.987	.765	91,500	
75,000	1.29	1.024	.824	91,020	
80,000	1.21	1.062	.886	90,290	
85,000	1.14	1.100	.950	89,470	
90,000	1.06	1.143	1.026	87,720	
95,000	.98	1.21	1.150	82,610	Opens longitudinal seams.
100,000	.93	1.25	1.227	81,500	
		1.10	....	....	End diameter.
110,000	.86	1.31	1.348	81,600	
		1.10	....	....	Do.

Two principal seams opened on opposite sides of cylinder, ".18 and ".15 wide respectively.

No. 1007.

ANNEALED SPECIMEN FROM FRACTURED BAR, TAKEN 4½ INCHES FROM POINT OF RUPTURE.

Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
0	2.00	.798	.50	0	
15,000	2.00	.798	.50	30,000	
20,000	2.00	.7985	.501	39,920	
25,000	1.995	.7995	.502	49,800	
27,500	1.985	.8025	.506	54,350	
30,000	1.96	.809	.514	58,360	
32,500	1.93	.8145	.521	62,380	
35,000	1.89	.822	.531	65,910	
37,500	1.865	.830	.541	69,320	
40,000	1.825	.838	.552	72,460	
42,500	1.795	.847	.563	75,490	
45,000	1.745	.858	.578	77,850	
Rested under zero load three hours.					
47,500	1.745	.858	.578	82,180	
50,000	1.695	.872	.597	83,750	
52,500	1.67	.878	.605	86,780	
55,000	1.635	.888	.619	88,850	
60,000	1.555	.913	.655	91,600	
65,000	1.475	.944	.700	92,860	
70,000	1.39	.979	.753	92,960	
Rested under zero load fifteen hours.					
75,000	1.39	.979	.753	99,600	
78,000	....	....	....	....	Renewed yielding begins.
80,000	1.28	1.028	.830	96,390	
85,000	1.18	1.075	.908	93,610	
90,000	1.09	1.123	.990	90,910	
95,000	1.03	1.160	1.057	89,880	
100,000	.97	1.208	1.146	87,260	
103,000	.91	1.25	1.227	85,570	Longitudinal seams opened.
		1.08	....	....	End diameter.
110,000	.87	1.29	1.307	84,160	
		1.08	....	....	Do.

Opened two principal seams on opposite sides of the cylinder, ″.15 and ″.08 wide respectively.

No. 1008.

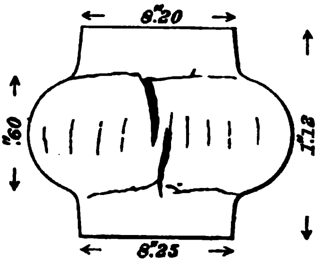
Marks, 10–334.

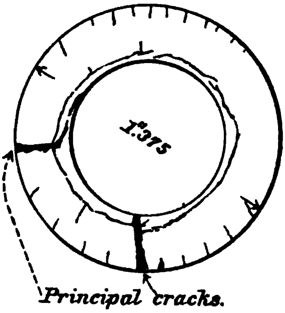
A cylinder 2″ long by ″.798 diameter was heated bright red, and when at that heat was placed in the testing machine and compressed.

The cylinder was shortened to 1″.12 length by a load of about 95,000 pounds total.

The ends immediately lost their color when in contact with the compression platforms. The middle section was cherry red at the close of this stage of the test.

The final shape was as follows, the cylinder beginning to assume this form with the first increment of load:





Longitudinal seams opened. The fractured surfaces were serrated, curved in conformity with the middle bulged surface.

After cooling to about 100° Fahr., again placed in the testing machine and loads applied.

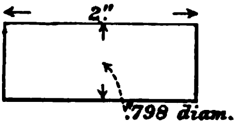
Applied loads.	Dimensions.		Sectional area.	Pounds per square inch.	Remarks.
	Length.	Diameter.			
Pounds.	*Inches.*	*Inches.*	*Sq. inches.*		
100,000	1.105±	....	....	....	
120,000	1.095	....	....	....	
130,000	1.09	....	....	....	
140,000	1.065	....	....	....	Sudden enlargement of seam in middle section.
150,000	.93	....	....	....	

Opened a third wide longitudinal seam, and shearing fractures separated in part the outside bulged portion from a central core the diameter of the ends.

The ends, which were chilled by contact with the cold platforms of the testing machine, appeared hardened when tested with a file. The middle or bulged section did not appear to have been hardened.

TABULATION OF CRUSHING TESTS AND COLD FLOW OF STEEL AND IRON CYLINDERS

Form of specimens.



No. of test.	Metal.	Marks.	Reduced length.	Concurrent compressive resistance per square inch.	Ultimate compressive resistance per square inch.	Maximum elongation of surface metal.	Tensile strength on ruptured section per square inch.
			Inches.	*Pounds.*	*Pounds.*	*Per cent.*	*Pounds.*
997	Steel	1-833	1.24 .83	84,030 85,470	85,580	72.8	106,484
981	Steel	2-123	1.31 .83	100,120 101,890	105,520	75.6	113,704
982	Steel	3-782	1.26 .95	115,150 115,560	116,790	80.5	126,640
983	Steel	4-795	1.26 .88	121,670 121,850	121,680	72.1	134,600
984	Steel	5-803	1.425 .89	131,760 131,900	133,480	95.5	152,880
985	Steel	6-797	1.245 .965	156,630 156,540	157,100	58.8	134,880
986	Steel	7-823	1.34 .89	156,250 156,640	156,800	59.1	151,510
987	Steel	8-750	1.465 1.20	194,240 196,300	196,300	54.5	158,140
988	Steel	9-756	1.60 .93	181,100 183,250	188,110	51.3	147,860
989	Steel	10-334	1.33 1.05	192,550 193,090	193,090	45.6	161,910
1005	Cast iron	....	1.825	96,320	96,820	9.6	....
1006	Wrought iron not annealed.	....	1.545 1.21	90,630 90,290	91,500	43.2	....
1007	Wrought iron annealed.	....	1.555 1.18	91,600 93,010	93,610	51.4	....

In column headed "Maximum elongation of surface metal" are the elongations which the metal at the circumference underwent up to the time fractures appeared in the bulged surface. Figures in last column taken from tensile tests.

THE CO-EFFICIENT OF EXPANSION BY HEAT OF STEEL AND IRON BARS.

The steel bars experimented upon were turned down from 1¼″ diameter to 1″.0092, and were 36″ long.

The cast-iron and wrought-iron bars were 1″.129 diameter and the copper 1¼″.

The measurements were taken in the same manner as were the diameters of the cylinders used in the experiments on initial strains; that is, holes near the extremities of the specimens were drilled and countersunk defining the limits of the gauged length, and which received the conical points of the micrometer.

The bars were immersed in a cold bath of ice water, their lengths determined, then placed in a bath of hot oil and again measured. A standard bar was kept in the cold bath, to which the length of the micrometer was referred before and after each measurement was taken.

The principal parts of the micrometer were protected by a felt covering from rapid changes of temperature, and while in use only the conical points entered the liquid of the bath.

The experimental bars were kept in each bath not less than two hours before the measurements were taken.

The co-efficient of expansion is reduced to the expansion per degree Fahrenheit per unit of length.

Table No. 1.

STEEL BARS, FIRST SET.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Cold.	Hot.	Difference.	Cold.	Hot.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	33.5	220.0	186.5	34.9975	35.0416	.0441	.0000067565
2-123	33.5	234.0	200.5	35.0012	35.0479	.0467	.0000066545
3-782	33.5	247.5	214.0	34.9986	35.0491	.0505	.0000067426
4-795	33.5	247.0	213.5	34.9936	35.0434	.0498	.0000066657
5-803	33.5	237.2	203.7	34.9972	35.0432	.0460	.0000064536
6-797	33.5	222.8	189.3	34.9961	35.0395	.0434	.0000065512
7-823	33.5	234.5	201.0	35.0000	35.0463	.0463	.0000065814
8-750	33.5	236.7	203.2	34.9936	35.0387	.0451	.0000063426
9-756	33.5	234.0	200.5	34.9982	35.0422	.0440	.0000062703
10-334	33.5	229.0	195.5	34.9977	35.0401	.0424	.0000061979

TABLE No. 2.

STEEL BARS, SECOND SET.

The bars were kept in the cold bath twelve hours and then measured, after which they were heated in the oil for a period of twenty hours. The temperature in the mean time ranged from 240° to 302° Fahrenheit. The bars were then slowly cooled in the bath to 235°, and remained at that temperature two hours, after which they were measured while at the temperatures recorded in the table.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Cold.	Hot.	Difference.	Cold.	Hot.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	33.5	230.5	197.0	35.0013	35.0482	.0469	.0000068078
2-123	33.5	226.0	192.5	35.0005	35.0453	.0448	.0000066493
3-782	33.5	235.4	201.9	34.9923	35.0384	.0461	.0000065252
4-795	33.5	235.0	201.5	35.0027	35.0498	.0471	.0000066780
5-803	33.5	234.0	200.5	34.9953	35.0421	.0468	.0000066609
6-797	33.5	235.0	201.5	35.0001	35.0453	.0452	.0000064091
7-823	33.5	227.5	194.0	34.9982	35.0425	.0443	.0000065246
8-750	33.5	235.0	201.5	....	35.0409	....	....
9-756	22.5	227.5	194.0	35.0050	35.0482	.0432	.0000063613
10-334	33.5	230.0	196.5	34.9991	35.0417	.0426	.0000061943

TABLE No. 3.

STEEL BARS, SECOND SET.

After the treatment last described, the bars were slowly cooled, returned to the cold bath, and again measured. The lengths and temperatures while hot were taken from the preceding table.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Hot.	Cold.	Difference.	Hot.	Cold.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	230.5	33.5	197.0	35.0482	35.0013	.0469	.0000068018
2-122	226.0	33.5	192.5	35.0453	35.0005	.0448	.0000066493
3-782	235.4	33.5	201.9	35.0384	34.9924	.0460	.0000065110
4-795	235.0	33.5	201.5	35.0498	35.0029	.0469	.0000066496
5-803	234.0	33.5	200.5	35.0421	34.9951	.0470	.0000066985
6-797	235.0	33.5	201.5	35.0453	35.0002	.0451	.0000063949
7-823	227.5	33.5	194.0	35.0425	34.9985	.0440	.0000064804
8-750	235.0	33.5	201.5	35.0409	34.9972	.0437	.0000062061
9-756	227.5	33.5	194.0	35.0482	35.0049	.0433	.0000063761
10-334	230.0	33.5	196.5	35.0417	34.9988	.0429	.0000062379

The bars returned cold to substantially their original lengths, the protracted heating being without effect.

TABLE NO. 4.

STEEL BARS, THIRD SET.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Cold.	Hot.	Difference.	Cold.	Hot.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	33.5	231.8	198.3	35.0033	35.0500	.0467	.0000067281
2-123	33.5	231.7	198.2	35.0021	35.0482	.0461	.0000066451
3-782	33.5	231.0	197.5	35.0024	35.0483	.0459	.0000066397
4-795	33.5	229.0	195.5	34.9978	35.0435	.0457	.0000066793
5-803	33.5	232.0	198.5	34.9941	35.0405	.0464	.0000066798
6-797	33.5	231.5	198.0	35.0008	35.0450	.0442	.0000063779
7-823	33.5	229.0	195.5	34.9987	35.0432	.0445	.0000065037
8-750	33.5	231.5	198.0	34.9987	35.0420	.0433	.0000062485
9-756	33.5	230.5	197.0	34.9965	35.0396	.0431	.0000062515
10-334	33.5	231.8	198.3	35.0019	35.0450	.0431	.0000062096

TABLE NO. 5.

STEEL BARS, THIRD SET.

The bars were heated bright cherry red and quenched in oil at 80° Fahr. The oil for this purpose was contained in a cylinder 5¾" diameter of bore, the bars being dipped in the oil endwise in a vertical position. When a bar was quenched the temperature of the oil rose to about 240° Fahr. The cylinder was surrounded with snow and the temperature of the oil lowered again to 80° before quenching the next specimen.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Cold.	Hot.	Difference.	Cold.	Hot.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	33.5	224.6	191.1	34.9539	34.9970	.0431	.0000064525
2-123	33.5	235.0	201.5	34.9769	35.0249	.0480	.0000068106
3-782	33.5	234.0	200.5	35.0016	35.0484	.0468	.0000066687
4-795	33.5	234.1	200.6	34.9826	35.0303	.0477	.0000067973
5-803	33.5	223.2	189.7	34.9986	35.0424	.0438	.0000065971
6-797	33.5	220.5	187.0	35.0296	35.0700	.0404	.0000061675
7-823	33.5	233.6	200.1	....	35.0674	....	....
8-750	33.5	233.5	200.0	35.0100	35.0541	.0441	.0000062982
9-756	33.5	220.3	186.8	35.0256	35.0620	.0364	.0000055634
10-334	33.5	224.6	191.1	35.0153	35.0526	.0373	.0000055743

The apparent reduction of the co-efficient of expansion, notably Nos. 9 and 10, is due, as will be seen in the next table, to the diminution in length, which doubtless took place while the bars were hot, but which is detected only when they are brought back again to the temperature of the cold bath.

TABLE No. 6.

STEEL BARS, THIRD SET.

Bar returned to the cold bath and re-measured.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Hot.	Cold.	Difference.	Hot.	Cold.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	224.6	33.5	191.1	34.9970	34.9532	.0438	.0000065573
2-123	235.0	33.5	201.5	35.0249	34.9767	.0482	.0000068390
3-782	234.0	33.5	200.5	35.0484	35.0019	.0465	.0000066259
4-795	234.1	33.5	200.6	35.0303	34.9823	.0480	.0000068401
5-803	223.2	33.5	189.7	35.0424	34.9977	.0447	.0000067328
6-797	220.5	33.5	187.0	35.0700	35.0291	.0409	.0000062439
7-823	233.6	33.5	200.1	35.0674	35.0216	.0458	.0000065356
8-750	233.5	33.5	200.0	35.0541	35.0101	.0440	.0000062839
9-756	220.3	33.5	186.8	35.0620	35.0219	.0401	.0000061295
10-334	224.6	33.5	191.1	35.0526	35.0106	.0420	.0000062776

The diminutions in gauged lengths of the cold bars, taking the differences in lengths between tables Nos. 5 and 6, are as follows:

Bar.	Diminution in length.
	Inch.
1-833	.0007
2-123	.0002
3-782	—.0003
4-795	.0003
5-803	.0009
6-797	.0005
8-750	—.0001
9-756	.0037
10-334	.0047

TABLE No. 7

STEEL BARS, THIRD SET.

The bars again heated bright cherry red and quenched in water at temperature of 50° to 55° Fahr.

The water was contained in the same cylinder previously used when oil was the quenching fluid.

When a bar was quenched the temperature of the water rose to about 115° Fahr.

The bars warped more or less each time they were quenched.

After a rest of seventy-two hours they were measured in the cold bath, and after a further rest of eighteen hours were measured in the hot bath.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Cold.	Hot.	Difference.	Cold.	Hot.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	33.5	232.2	198.7	34.8929	34.9381	.0452	.0000065193
2-123	33.5	229.5	196.0	34.9782	35.0219	.0437	.0000063742
3-782	33.5	230.5	197.0	34.9696	35.0137	.0441	.0000064015
4-795	33.5	229.5	196.0	35.0481	35.0906	.0425	.0000061868
5-808	33.5	231.5	198.0	35.0950	35.1427	.0477	.0000068645
6-797	33.5	233.7	200.2	35.0192	35.0521	.0329	.0000046927
7-823	33.5	231.5	198.0	35.0190	35.0539	.0349	.0000050333
8-750	33.5	232.0	198.5	34.9494	34.9710	.0216	.0000031135
9-756	33.5	233.5	200.0	34.9599	34.9779	.0180	.0000025744
10-334	33.5	229.0	195.5	34.9485	34.9646	.0161	.0000023564

Here again the first set of observations show an apparent reduction of the co-efficient of expansion due to the diminution of the length of the bars probably while in the heated bath.

TABLE No. 8.

STEEL BARS, THIRD SET.

Bars returned to cold bath.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Hot.	Cold.	Difference.	Hot.	Cold.	Difference.	
				Inches.	*Inches.*	*Inches.*	
1-833	232.2	33.5	198.7	34.9381	34.8909	.0472	.0000068082
2-123	229.5	33.5	196.0	35.0219	34.9760	.0459	.0000066956
3-782	230.5	33.5	197.0	35.0137	34.9686	.0451	.0000065469
4-795	229.5	33.5	196.0	35.0906	35.0436	.0470	.0000068428
5-808	231.5	33.5	198.0	35.1427	35.0929	.0498	.0000071671
6-797	233.7	33.5	200.2	35.0521	35.0042	.0479	.0000068353
7-823	231.5	33.5	198.0	35.0539	35.0082	.0457	.0000065930
8-750	232.0	33.5	198.5	34.9716	34.9223	.0487	.0000070253
9-756	233.5	33.5	200.0	34.9779	34.9256	.0523	.0000074873
10-334	229.0	33.5	195.5	34.9646	34.9148	.0498	.0000072959

The diminution in length of the cold bars, taking the differences between the lengths in tables 7 and 8, are as follows:

Bar.	Diminution in length.
	Inch.
1-833	.0020
2-123	.0022
3-782	.0010
4-795	.0045
5-808	.0021
6-797	.0150
7-823	.0108
8-750	.0271
9-756	.0343
10-334	.0337

The high-temper bars again show the greatest diminution in length.

Heretofore the bars have shown a lower co-efficient as the per cent. of carbon they contained increased; but in the present set of observations, made on these bars after they were hardened in water and divested of the element of diminution in length from the action of the hot bath, there is seen a decided elevation of the co-efficient in the high-temper bars, which elevation is retained after the protracted heating which preceded the observations recorded in table 9.

TABLE No. 9.

STEEL BARS, THIRD SET.

Bars kept at a temperature of 300° Fahr. in oil bath a period of six hours, then gradually cooled in the bath; fifteen hours later the bars were heated and re-measured.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Hot.	Cold.	Difference.	Hot.	Cold.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-838	239.0	33.5	205.5	34.9400	34.8915	.0485	.0000067641
2-128	239.5	33.5	206.0	35.0238	34.9758	.0480	.0000066622
3-782	242.7	33.5	209.2	35.0160	34.9670	.0490	.0000066985
4-795	238.5	33.5	205.0	35.0897	35.0413	.0484	.0000067377
5-803	243.0	33.5	209.5	35.1446	35.0933	.0513	.0000069776
6-797	241.5	33.5	208.0	35.0448	34.9960	.0488	.0000067041
7-823	240.5	33.5	207.0	35.0503	35.0018	.0485	.0000066939
8-750	240.0	33.5	206.5	34.9665	34.9169	.0496	.0000068790
9-756	240.5	33.5	207.0	34.9728	34.9201	.0527	.0000072996
10-834	241.2	33.5	207.7	34.9619	34.9100	.0519	.0000071578

The further diminution in length after heating to 300° Fahr. was as follows:

Bar.	Diminution in length.
	Inch.
1-838	—.0006
2-128	.0002
3-782	.0016
4-795	.0028
5-803	—.0004
6-797	.0062
7-823	.0064
8-750	.0054
9-756	.0055
10-834	.0048

The co-efficient of expansion continues to be highest for the hardened high-temper bars.

TABLE No. 10.

STEEL BARS, THIRD SET.

Bars annealed by heating bright red and cooling in pine shavings:

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Cold.	Hot.	Difference.	Cold.	Hot.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	33.5	233.0	199.5	34.8875	34.9340	.0465	.0000066810
2-123	33.5	233.5	200.0	34.9625	35.0080	.0455	.0000065070
3-782	33.5	231.2	197.7	34.9654	35.0106	.0452	.0000065387
4-795	33.5	231.6	198.1	34.9939	35.0400	.0461	.0000066500
5-803	33.5	231.2	197.7	35.0456	35.0916	.0460	.0000066392
6-797	33.5	234.0	200.5	34.9485	34.9926	.0441	.0000062935
7-823	33.5	226.6	193.1	34.9595	35.0022	.0427	.0000063253
8-750	33.5	235.6	202.1	34.8761	34.9196	.0435	.0000061715
9-756	33.5	232.5	199.0	34.8883	34.9306	.0423	.0000060927
10-334	33.5	233.3	199.8	34.8841	34.9263	.0422	.0000060547

The bars were shortened on the gauged lengths, measured when cold, as follows:

Bar.	Diminution in length.	Bar.	Diminution in length.
	Inch.		*Inch.*
1-833	.0040	6-797	.0475
2-123	.0133	7-823	.0423
3-782	.0016	8-750	.0408
4-795	.0474	9-756	.0318
5-803	.0477	10-334	.0259

A part of the apparent diminution in length may be due to the warping of the bars, although it will be seen that all the bars are shorter than before annealing, and it is believed that this result is principally due to the annealing.

The co-efficient of expansion for the high-temper bars has now been restored, and is below that of the mild steel bars.

TABLE No. 11.

STEEL BARS, THIRD SET.

Bars again returned to the cold bath.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Hot.	Cold.	Difference.	Hot.	Cold.	Difference.	
				Inches.	*Inches.*	*Inch.*	
1-833	233.0	33.5	199.5	34.9340	34.8869	.0471	.0000067673
2-123	233.5	33.5	200.0	35.0080	34.9615	.0465	.0000066502
3-782	231.2	33.5	197.7	35.0106	34.9659	.0447	.0000064663
4-795	231.6	33.5	198.1	35.0400	34.9940	.0460	.0000066356
5-803	231.2	33.5	197.7	35.0916	35.0460	.0456	.0000065814
6-797	234.0	33.5	200.5	34.9926	34.9484	.0442	.0000063078
7-823	226.6	33.5	193.1	35.0022	34.9589	.0433	.0000064143
8-750	235.6	33.5	202.1	34.9196	34.8765	.0431	.0000061147
9-756	232.5	33.5	199.0	34.9306	34.8886	.0420	.0000060494
10-334	233.3	33.5	199.8	34.9263	34.8833	.0427	.0000061265

Comparatively little difference exists in the lengths of the bars cold, between tables Nos. 10 and 11, hence the co-efficients of expansion are nearly alike in each.

TABLE No. 12.

WROUGHT IRON.

Marks.	Temperature of baths (degrees Fahr.).			Gauged length.			Co-efficient of expansion.
	Cold.	Hot.	Difference.	Cold.	Hot.	Difference.	
				Inches.	*Inches.*	*Inch.*	
210-L_1 .	33.5	212.0	178.5	29.9896	30.0255	.0359	.0000067063
218-S_1 ..	33.5	211.5	178.0	29.9805	30.0166	.0361	.0000067647
218-S_2 ..	33.5	212.0	178.5	29.9846	30.0205	.0359	.0000067075
218-S_3 ..	33.5	212.5	179.0	29.9949	30.0311	.0362	.0000067423

CAST IRON.

No. 1...	33.5	224.6	191.1	30.0039	30.0381	.0342	.0000059647
No. 2...	33.5	218.0	184.5	30.0040	30.0369	.0329	.0000059434
No. 3...	33.5	221.5	188.0	29.9929	30.0260	.0331	.0000058702

COPPER.

....	33.5	217.2	183.7	29.9954	30.0457	.0503	.0000091286

The wrought-iron bars had been previously strained in tensile tests of the metal, bar S_3 being annealed before determining its co-efficient of expansion; the other bars were not annealed.

The cast-iron bars were from a slab of gun-iron, being the same metal used in other tests of the temperature series.

TABLE No. 13.

[Constructed from the average results of the steel bars recorded in tables 1, 2, 3, 4, 10, and 11, from the average of the wrought-iron and the cast-iron bars.]

Metal.	Marks.	Co-efficient of expansion.
Wrought iron	....	.0000067302
Steel..................	1-833	.0000067561
Do..................	2-123	.0000068259
Do..................	3-782	.0000065149
Do..................	4-795	.0000066597
Do..................	5-803	.0000066202
Do..................	6-797	.0000063891
Do..................	7-823	.0000064716
Do..................	8-750	.0000062167
Do..................	9-756	.0000062335
Do..................	10-334	.0000061700
Cast iron	....	.0000059261
Copper	....	.0000091286

Arranging the bars in one column in the following table according to the quantity of iron present in the steel by difference, from the analyses furnished by the steel manufacturers, the elements not included in the analyses being present only in small quantities, and the second column according to their co-efficients of expansion, and it is seen that the expansion of the metal decreases with the amount of iron; that is, the higher the temper of the steel the lower its co-efficient of expansion within the range of temperatures here experimented upon.

If the sets of bars 4–795, 5–803, and 8–750 were omitted from the table, the remaining sets of seven grades of steel would follow in exactly the same order in each column.

The expansion of the wrought-iron bars closely corresponds to that of the mildest steel, and the expansion of the cast-iron is below that of the highest temper steel here represented.

TABLE No. 14.

[Steel bars arranged in the first column according to the quantity of iron present, in the second column according to their co-efficients of expansion, the highest values of each appearing first.]

According to amount of iron present.	According to co-efficient of expansion.
Marks.	*Marks.*
1–833	1–833
2–123	4–795
3–782	2–123
4–795	5–803
5–803	3–782
7–823	7–823
8–750	6–797
6–797	9–756
9–756	8–750
10–334	10–334

THE MODULUS OF ELASTICITY OF STEEL AND IRON BARS AT DIFFERENT TEMPERATURES.

Observations were made at temperatures between 68° and 498° Fahr.

The specimens were heated in an oil bath contained in a cylinder which was 48″ long and 6″ diameter inside.

The oil cylinder was closed at the ends with caps which were bored centrally to allow the stems of the sockets to pass through; a stuffing-box prevented leakage of oil.

The specimens were secured to the sockets, the outside ends of the sockets being secured to the holders of the testing machine. Along the upper side of the cylinder was an opening $2\frac{1}{2}''$ wide, giving access to the specimen in the bath. A row of gas-burners below the cylinder supplied the necessary heat.

Micrometer observations were taken in a similar manner to those when determining the co-efficients of expansion; the conical points of the instrument reaching down through the surface of the liquid of the bath to the holes in the specimen which defined the extremities of the gauged length.

During the tests of bars 1–833, 5–803, and 10–334, the micrometer was removed from the specimens after the readings in each temperature.

While testing the other bars the micrometer remained in position on the specimens throughout the tests. This last method allowed the instrument to acquire a high temperature, but not sufficient to materially change the pitch of the micrometer screw, on which the accuracy of the readings in part depended.

A number of repetitions of readings were made at each temperature, and the mean of the upward and downward readings taken as the elongation from which the modulus of elasticity was computed.

On account of the directness of the method employed in these determinations, confidence is felt that the results closely indicate the true changes which occurred in the modulus of elasticity, notwithstanding difficulties are experienced precluding the same degree of accuracy which is attained at atmospheric temperatures.

The modulus of elasticity is lowered as the temperature of the metal is increased.

Some individual bars exhibit irregularity of action, and show a different modulus at corresponding temperatures measured when the temperature of the bar was rising, and when falling; and some show practically no difference.

Computing the changes of the modulus per degree of temperature for the several bars, using only the extreme ranges of temperature, we have the following table:

Metal.	Marks.	Temperature (degrees Fahr.).			Corresponding modulus of elasticity.			Reduction per degree Fahr.
		Minimum.	Maximum.	Difference.	At minimum temperature.	At maximum temperature.	Difference.	
					Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
Wrought iron..	210 L	84	495	411	26, 549, 000	25, 000, 000	1, 549, 000	3, 769
	218 S_1	88	450	362	26, 786, 000	24, 194, 000	2, 592, 000	7, 160
	218 S_2	84	452	368	27, 356, 000	24, 658, 000	2, 698, 000	7, 331
Steel...........	1-833	70	455	385	30, 612, 000	27, 419, 000	3, 193, 000	8, 294
	2-123	74	470	396	29, 268, 000	26, 667, 000	2, 601, 000	6, 568
	3-782	68	475	407	29, 221, 000	27, 108, 000	2, 113, 000	5, 191
	4-795	68	475	407	29, 801, 000	27, 608, 000	2, 193, 000	5, 388
	5-803	60	470	390	29, 630, 000	27, 211, 000	2, 419, 000	6, 202
	6-797	80	465	385	30, 000, 000	28, 103, 000	1, 897, 000	4, 927
	7-825	74	480	406	29, 851, 000	28, 236, 000	1, 615, 000	3, 978
	8-750	76	470	394	29, 703, 000	28, 037, 000	1, 666, 000	4, 228
	9-756	80	470	390	30, 120, 000	28, 302, 000	1, 818, 000	4, 662
	10-334	80	455	375	29, 126, 000	27, 778, 000	1, 348, 000	3, 505
Cast iron	1	82	472	390	14, 483, 000	13, 953, 000	530, 000	1, 359
	2	82	475	393	14, 434, 000	13, 505, 000	929, 000	2, 364
	3	70	490	420	15, 613, 000	13, 861, 000	1, 752, 000	4, 171

Extended deductions from so few experiments can hardly be made, yet the results, such as they are, follow much after the manner of the co-efficient of expansion tests.

The maximum reduction in the modulus of elasticity is found in the wrought-iron and mild-steel bars, with an evident tendency to lessen the reduction in the higher temper bars, with the least change displayed by the cast iron.

The elastic limit of steel bar 1-833 at atmospheric temperature was 30,000 pounds per square inch; at the temperature of 455° Fahr. it was below 21,000 pounds per square inch.

Wrought-iron bar 210 L was taken from the fractured end of specimen No. 604, page 197 of report of 1882. It fractured with a load of 50,188 pounds per square inch, measured on the original section. Its elastic limit after the tensile test and a period of rest would doubtless be somewhat higher than the tensile strength first ascertained.

In the present series of tests this bar was loaded with 31,000 pounds per square inch on the sectional area as it then existed, and when heated to 400° Fahr., and showed no permanent set. At the temperature of 495° the elastic limit was reached under the above load.

The higher temperatures did not appreciably increase the permanent sets in the cast-iron bars above those which were caused by the first loading.

The usual order of making the test was reversed with bar 3, which was heated before tensile stresses were applied, but the permanent sets were practically the same as when the metal was first loaded cold.

Test bars are being prepared with which to continue this series.

DETAILS OF TESTS OF STEEL AND IRON BARS, TO DETERMINE THE MODULUS OF ELASTICITY AT DIFFERENT TEMPERATURES.

Wrought iron.

No. 1338.

Marks, 210 L.
Diameter, 1''.129.
Sectional area, 1 square inch.
Gauged length, 30''.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
84	31,000	31,000	.0337	....	....		
	1,000	1,000	—.0002	....	.0339		
	31,000	31,000	.0337	.0339	....		
	1,000	1,000	—.0002	....	.0339		
	31,000	31,000	.0339	.0341	....		
	1,000	1,000	+.0004	....	.0335	.0339	26,549,000
	31,000	31,000	.0341	.0337	....		
	1,000	1,000	.0002	....	.0339		
	31,000	31,000	.0342	.0340	....		
	1,000	1,000	.0004	....	.0338		
212	31,000	31,000	.0467	....	....		
	1,000	1,000	.0119	....	.0348		
	31,000	31,000	.0468	.0349	....		
	1,000	1,000	.0120	....	.0348		
	31,000	31,000	.0467	.0347	....		
	1,000	1,000	.0121	....	.0346	.0348	25,862,000
	31,000	31,000	.0468	.0347	....		
	1,000	1,000	.0120	....	.0348		
	31,000	31,000	.0468	.0348	....		
	1,000	1,000	.0120	....	.0348		
318	31,000	31,000	.0614	....	....		
	1,000	1,000	.0264	....	.0350		
	31,000	31,000	.0615	.0351	....		
	1,000	1,000	.0265	....	.0350		
	31,000	31,000	.0621	.0356	....		
	1,000	1,000	.0265	....	.0356	.0353	25,496,000
	31,000	31,000	.0620	.0355	....		
	1,000	1,000	.0267	....	.0353		
	31,000	31,000	.0622	.0355	....		
	1,000	1,000	.0269	....	.0353		
400	31,000	31,000	.0726	....	....		
	1,000	1,000	.0367	....	.0359		
	31,000	31,000	.0726	.0359	....		
	1,000	1,000	.0369	....	.0357		
	31,000	31,000	.0726	.0357	....		
	1,000	1,000	.0371	....	.0355	.0356	25,281,000
	31,000	31,000	.0726	.0355	....		
	1,000	1,000	.0371	....	.0355		
	31,000	31,000	.0725	.0354	....		
	1,000	1,000	.0368	....	.0357		

No. 1338—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity. E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
495	31,000	31,000	.0950	....	....		
	1.000	1,000	.0590	....	.0360		
	31,000	31,000	.0959	.0369	....		
	1,000	1,000	.0598	....	.0361		
	31,000	31,000	.0973	.0375	....		
	1.000	1,000	.0615	....	.0358	.0364	24,725,000
	31,000	31,000	.0982	.0367	....		
	1,000	1,000	.0625	....	.0357		
	31,000	31,000	.0997	.0372	....		
	1,000	1,000	.0639	....	.0358		
	26,000	26,000	.0940	....	....		
	1,000	1,000	.0640	....	.0300		
	26,000	26,000	.0940	.0300	....		
	1,000	1,000	.0639	....	.0301		
	26,000	26,000	.0940	.0301	....		
	1,000	1,000	.0640	....	.0300	.0300	25,000,000
	26,000	26,000	.0940	.0300	....		
	1,000	1,000	.0643	....	.0297		
	26,000	20,000	.0043	.0300	....		
	1,000	1,000	.0639	....	.0304		
Load of 31,000 pounds per square inch kept on the bar while it cooled from 480° Fahr. to 95° Fahr., then observations on the modulus of elasticity again made.							
95	31,000	31,000	.0686	....	....		
	1,000	1,000	.0348	....	.0338		
	31,000	31,000	.0682	.0334	....		
	1,000	1,000	.0351	....	.0331		
	31,000	31,000	.0683	.0332	....		
	1,000	1,000	.0348	....	.0335	.0334	26,946,000
	31,000	31,000	.0682	.0334	....		
	1,000	1,000	.0348	....	.0334		
	31,000	21,000	.0682	.0334	....		
	1,000	1,000	.0350	....	.0332		

Wrought iron.

No. 1339.

Marks, 218 S_1.
Diameter, 1″.129.
Sectional area, 1 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
88	31,000	31,000	.0362	....	....		
	1,000	1,000	.0027	....	.0335		
	31,000	31,000	.0361	.0335	....		
	1,000	1,000	.0026	....	.0335		
	31,000	31,000	.0363	.0337	....		
	1,000	1,000	.0028	....	.0335	.0336	26,786,000
	31,000	31,000	.0363	.0335	....		
	1,000	1,000	.0028	....	.0335		
	31,000	31,000	.0365	.0337	....		
	1,000	1,000	.0028	....	.0337		
200	31,000	31,000	.0484	....	....		
	1,000	1,000	.0143	....	.0341		
	31,000	31,000	.0488	.0345	....		
	1,000	1,000	.0146	....	.0342		
	31,000	31,000	.0495	.0349	....		
	1,000	1,000	.0155	....	.0340	.0343	26,239,000
	31,000	31,000	.0498	.0343	....		
	1,000	1,000	.0157	....	.0341		
	31,000	31,000	.0502	.0345	....		
	1,000	1,000	.0159	....	.0343		
296	31,000	31,000	.0585	....	....		
	1,000	1,000	.0237	....	.0348		
	31,000	31,000	.0597	.0360	....		
	1,000	1,000	.0248	....	.0349		
	31,000	31,000	.0601	.0353	....		
	1,000	1,000	.0250	....	.0351		
	31,000	31,000	.0605	.0355	....	.0353	25,496,000
	1,000	1,000	.0250	....	.0355		
	31,000	31,000	.0607	.0357	....		
	1,000	1,000	.0254	....	.0353		
	31,000	31,000	.0609	.0355	....		
	1,000	1,000	.0258	....	.0351		
385	31,000	31,000	.0693	....	....		
	1,000	1,000	.0331	....	.0362		
	31,000	31,000	.0703	.0372	....		
	1,000	1,000	.0341	....	.0362		
	31,000	31,000	.0710	.0369	....		
	1,000	1,000	.0343	....	.0367	.0366	24,590,000
	31,000	31,000	.0710	.0367	....		
	1,000	1,000	.0349	....	.0361		
	31,000	31,000	.0716	.0367	....		
	1,000	1,000	.0348	....	.0368		
450	31,000	31,000	.0788	....	....		
	1,000	1,000	.0425	....	.0363		
	31,000	31,000	.0796	.0371	....		
	1,000	1,000	.0424	....	.0372		
	31,000	31,000	.0795	.0371	....		
	1,000	1,000	.0423	....	.0372	.0372	24,194,000
	31,000	31,000	.0802	.0379	....		
	1,000	1,000	.0427	....	.0375		
	31,000	31,000	.0800	.0373	....		
	1,000	1,000	.0428	....	.0372		
90	31,000	31,000	.0408	....	....		
	1,000	1,000	.0068	....	.0335		
	31,000	31,000	.0403	.0335	....		
	1,000	1,000	.0067	....	.0336		
	31,000	31,000	.0403	.0336	....		
	1,000	1,000	.0067	....	.0336	.0336	26,786,000
	31,000	31,000	.0405	.0338	....		
	1,000	1,000	.0069	....	.0336		
	31,000	31,000	.0405	.0336	....		
	1,000	1,000	.0070	....	.0335		

Wrought iron.

No. 1340.

Marks, 218–S_2.
Diameter, 1″.129.
Sectional area, 1 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
84	31,000	31,000	.0356				
	1,000	1,000	.0030		.0326		
	31,000	31,000	.0359	.0329			
	1,000	1,000	.0036		.0323		
	31,000	31,000	.0362	.0326			
	1,000	1,000	.0030		.0332	.0329	27,356,000
	31,000	31,000	.0363	.0333			
	1,000	1,000	.0037		.0326		
	31,000	31,000	.0367	.0330			
	1,000	1,000	.0035		.0332		
215	31,000	31,000	.0507				
	1,000	1,000	.0165		.0342		
	31,000	31,000	.0508	.0343			
	1,000	1,000	.0168		.0340		
	31,000	31,000	.0513	.0345			
	1,000	1,000	.0168		.0345	.0344	26,163,000
	31,000	31,000	.0515	.0347			
	1,000	1,000	.0173		.0342		
	31,000	31,000	.0518	.0345			
	1,000	1,000	.0175		.0343		
324	31,000	31,000	.0600				
	1,000	1,000	.0253		.0347		
	31,000	31,000	.0603	.0350			
	1,000	1,000	.0258		.0345		
	31,000	31,000	.0608	.0350			
	1,000	1,000	.0260		.0348	.0349	25,788,000
	31,000	31,000	.0610	.0350			
	1,000	1,000	.0261		.0349		
	[illegible]	31,000	.0615	.0354			
	1,000	1,000	.0263		.0352		
452	31,000	31,000	.0764				
	1,000	1,000	.0405		.0359		
	31,000	31,000	.0768	.0363			
	1,000	1,000	.0410		.0358		
	31,000	31,000	.0775	.0365			
	1,000	1,000	.0407		.0368	.0365	24,658,000
	31,000	31,000	.0776	.0369			
	1,000	1,000	.0410		.0366		
	31,000	31,000	.0780	.0370			
	1,000	1,000	.0413		.0367		
95	31,000	31,000	.0397				
	1,000	1,000	.0060		.0337		
	31,000	31,000	.0397	.0337			
	1,000	1,000	.0063		.0334		
	31,000	31,000	.0397	.0334			
	1,000	1,000	.0063		.0334	.0335	26,866,000
	31,000	31,000	.0397	.0334			
	1,000	1,000	.0062		.0335		
	31,000	31,000	.0397	.0335			
	1,000	1,000	.0062		.0335		

Steel.

No. 1279.

Marks, $\frac{1}{833}$.
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
70	800	1,000	0.	....	....		
	16,800	21,000	.0205	....	....		
	800	1,000	.0010	....	.0195		
	16,800	21,000	.0205	.0195	....		
	800	1,000	.0008	....	.0197	.0196	30,612,000
	16,600	21,000	.0205	.0197	....		
	800	1,000	.0007	....	.0198		
115	800	1,000	.0039	....	....		
	16,800	21,000	.0244	....	....		
	800	1,000	.0042	....	.0202		
	16,800	21,000	.0252	.0210	....		
	800	1,000	.0044	....	.0208	.0207	28,986,000
	16,800	21,000	.0253	.0209	....		
	800	1,000	.0045	....	.0208		
170	800	1,000	.0059	....	....		
	16,800	21,000	.0270	....	....		
	800	1,000	.0064	....	.0206		
	16,800	21,000	.0270	.0206	....		
	800	1,000	.0064	....	.0206	.0207	28,986,000
	16,800	21,000	.0272	.0208	....		
	800	1,000	.0065	....	.0207		
220	800	1,000	.0408	....	....		
	16,800	21,000	.0600	....	....		
	800	1,000	.0383	....	.0217		
	16,800	21,000	.0595	.0212	....		
	800	1,000	.0382	....	.0213		
	16,800	21,000	.0583	.0201	....		
	800	1,000	.0372	....	.0211	.02[illegible]	28,571,000
	16,800	21,000	.0583	.0211	....		
	800	1,000	.0369	....	.0214		
	16,800	21,000	.0570	.0201	....		
	800	1,000	.0359	....	.0211		
280	800	1,000	.0010	....	....		
	16,800	21,000	.0224	....	....		
	800	1,000	.0005	....	.0219		
	16,800	21,090	.0210	.0205	....		
	800	1,000	—.0007	....	.0217	.0210	28,571,000
	16,800	21,000	.0195	.0202	....		
	800	1,000	—.0018	....	.0213		
	16,800	21,000	.0185	.0203	....		
	800	1,000	—.0022	....	.0213		
310	800	1,000	.0558	....	....		
	16,800	21,000	.0762	....	....		
	800	1,000	.0542	....	.0220		
	16,800	21.000	.0748	.0206	....		
	800	1,000	.0527	....	.0221		
	16,800	21,000	.0737	.0210	....		
	800	1,000	.0532	....	.0205	.0211	28,436,000
	16,800	21,000	.0735	.0203	....		
	800	1,000	.0521	....	.0214		
	16,800	21,000	.0720	.0199	....		
	800	1,000	.0499	....	.0221		
355	800	1,000	.0497	....	....		
	16,800	21,000	.0698	....	....		
	800	1,000	.0478	....	.0220		
	16,800	21,000	.0684	.0206	....		
	800	1,000	.0470	....	.0214	.0213	28,169,000
	16,800	21,000	.0678	.0208	....		
	800	1,000	.0460	....	.0218		

No. 1279—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
355	16,800	21,000	.0669	.0209	....		
	800	1,000	.0454	....	.0215		
	800	1,000	.0394	....	....		
400	16,800	21,000	.0602	....	....		
	800	1,000	.0383	....	.0219		
	16,800	21,000	.0591	.0208	....		
	800	1,000	.0369	....	.0222	.0215	27,907,000
	16,800	21,000	.0577	.0208	....		
	800	1,000	.0356	....	.0221		
	16,800	21,000	.0563	.0207	....		
	800	1,000	.0345	....	.0218		
	800	1,000	.0570	....	....		
455	16,800	21,000	.0799	....	....		
	800	1,000	.0581	....	....		
	16,800	21,000	.0812	....	....	....	(*)
	800	1,000	.0600	....	....		
	16,800	21,000	.0875	....	....		
	800	1,000	.0688	....	....		
455	14,400	18,000	.0850	....	....		
	800	1,000	.0655	....	.0195		
	14,400	18,000	.0842	.0187	....		
	800	1,000	.0644	....	.0198	.0186	27,419,000
	14,400	18,000	.0815	.0171	....		
	800	1,000	.0625	....	.0190		
	14,400	18,000	.0800	.0175	....		
	800	1,000	.0612	....	.0188		

* Elastic limit passed.

Steel.

No. 1282.

Marks, $\overset{2}{123}$
Diameter, 1.″0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
74	800	1,000	.0533	....	....		
	16,800	21,000	.0729	....	....		
	800	1,000	.0530	....	.0199		
	16,800	21,000	.0726	.0204	....		
	800	1,000	.0536	....	.0190		
	16,800	21,000	.0727	.0191	....	.0195	30,770,000
	800	1,000	.0534	....	.0193		
	16,800	21,000	.0730	.0196	....		
	800	1,000	.0534	....	.0196		
	16,800	21,000	.0731	.0197	....		
	800	1,000	.0537	....	.0194		
Micrometer held in position by weights, and left on specimen throughout the experiment.							
74	800	1,000	.0547	....	....		
	16,800	21,000	.0747	....	....		
	800	1,000	.0545	....	.0202		
	16,800	21,000	.0749	.0204	....		
	800	1,000	.0546	....	.0203		
	16,800	21,000	.0751	.0205	....	.0205	29,268,000
	800	1,000	.0547	....	.0204		
	16,800	21,000	.0752	.0205	....		

No. 1282—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
74	800	1,000	.0548	....	.0204		
	16,800	21,000	.0755	.0207	....		
	800	1,000	.0545	....	.0210		
130	800	1,000	.0624	....	....		
	16,800	21,000	.0840	....	....		
	800	1,000	.0629	....	.0211		
	16,800	21,000	.0847	.0218	....		
	800	1,000	.0632	....	.0215		
	16,800	21,000	.0848	.0216	....	.0214	28,037,000
	800	1,000	.0636	....	.0212		
	16,800	21,000	.0852	.0216	....		
	800	1,000	.0640	....	.0212		
	16,800	21,000	.0856	.0216	....		
	800	1,000	.0644	....	.0212		
200	800	1,000	.0689	....	....		
	16,800	21,000	.0912	....	....		
	800	1,000	.0693	....	.0219		
	16,800	21,000	.0913	.0220	....		
	800	1,000	.0694	....	.0219		
	16,800	21,000	.0915	.0221	....		
	800	1,000	.0695	....	.0220	.0219	27,397,000
	16,800	21,000	.0916	.0221	....		
	800	1,000	.0698	....	.0218		
	16,800	21,000	.0917	.0219	....		
	800	1,000	.0698	....	.0219		
250	800	1,000	.0725	....	....		
	16,800	21,000	.0953	....	....		
	800	1,000	.0734	....	.0219		
	16,800	21,000	.0956	.0222	....		
	800	1,000	.0737	....	.0219		
	16,800	21,000	.0958	.0221	....	.0220	27,273,000
	800	1,000	.0738	....	.0220		
	16,800	21,000	.0959	.0221	....		
	800	1,000	.0740	....	.0219		
	16,800	21,000	.0962	.0222	....		
	800	1,000	.0744	....	.0218		
300	800	1,000	.0784	....	....		
	16,800	21,000	.1004	....	....		
	800	1,000	.0784	....	.0220		
	16,800	21,000	.1005	.0221	....		
	800	1,000	.0788	....	.0217		
	16,800	21,000	.1007	.0219	....		
	800	1,000	.0788	....	.0219	.0221	27,149,000
	16,800	21,000	.1009	.0221	....		
	800	1,000	.0787	....	.0222		
	16,800	21,000	.1012	.0225	....		
	800	1,000	.0789	....	.0223		
350	800	1,000	.0848	....	....		
	16,800	21,000	.1068	....	....		
	800	1,000	.0845	....	.0223		
	16,800	21,000	.1072	.0227	....		
	800	1,000	.0848	....	.0224		
	16,800	21,000	.1075	.0227	....	.0224	26,786,000
	800	1,000	.0851	....	.0224		
	16,800	21,000	.1072	.0221	....		
	800	1,000	.0854	....	.0218		
	16,800	21,000	.1080	.0226	....		
	800	1,000	.0858	....	.0222		
400	800	1,000	.0896	....	....		
	16,800	21,000	.1127	....	....		
	800	1,000	.0897	....	.0230		
	16,800	21,000	.1125	.0228	....		
	800	1,000	.0900	....	.0225	.0226	26,549,000
	16,800	21,000	.1125	.0225	....		
	800	1,000	.0901	....	.0224		
	16,800	21,000	.1126	.0225	....		
	800	1,000	.0901	....	.0225		
	16,800	21,000	.1126	.0225	....		
	800	1,000	.0901	....	.0225		

No. 1282—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
470	800	1,000	.0954	....	....		
	16,800	21,000	.1180	....	....		
	800	1,000	.0960	....	.0220		
	16,800	21,000	.1183	.0223	....		
	800	1,000	.0961	....	.0222		
	16,800	21,000	.1185	.0224	....		
	800	1,000	.0963	....	.0222	.0225	28,667,000
	16,800	21,000	.1190	.0227	....		
	800	1,000	.0961	....	.0229		
	16,800	21,000	.1187	.0226	....		
	800	1,000	.0960	....	.0227		
	16,800	21,000	.1182	.0222	....		
	800	1,000	.0954	....	.0228		
Gas turned off. Observations taken at intervals while the bar was cooling.							
410	800	1,000	.0895	....	....		
	16,800	21,000	.1107	....	....		
	800	1,000	.0889	....	.0218		
400	16,800	21,000	.1105	.0216	....		
	800	1,000	.0885	....	.0220		
	16,800	21,000	.1095	.0210	....	.0217	27,650,000
	800	1,000	.0878	....	.0217		
	16,800	21,000	.1100	.0222	....		
	800	1,000	.0879	....	.0221		
	16,800	21,000	.1092	.0213	....		
	800	1,000	.0878	....	.0214		
350	800	1,000	.0803	....	....		
	16,800	21,000	.1025	....	....		
	800	1,000	.0806	....	.0219		
	16,800	21,000	.1022	.0216	....		
	800	1,000	.0801	....	.0221		
	16,800	21,000	.1017	.0216	....	.0216	27,778,000
	800	1,000	.0805	....	.0212		
	16,000	21,000	.1017	.0212	....		
	800	1,000	.0798	....	.0219		
	16,000	21,000	.1014	.0216	....		
	800	1,000	.0799	....	.0215		
270	800	1,000	.0744	....	....		
	16,800	21,000	.0956	....	....		
	800	1,000	.0743	....	.0213		
	16,800	21,000	.0957	.0214	....		
	800	1,000	.0740	....	.0217		
	16,800	21,000	.0957	.0217	....	.0214	28,037,000
	800	1,000	.0742	....	.0215		
	16,800	21,000	.0955	.0213	....		
	800	1,000	.0741	....	.0214		
	16,800	21,000	.0954	.0213	....		
	800	1,000	.0740	....	.0214		
225	800	1,000	.0700	....	....		
	16,800	21,000	.0910	....	....		
	800	1,000	.0697	....	.0213		
	16,800	21,000	.0913	.0216	....		
	800	1,000	.0700	....	.0213		
	16,800	21,000	.0911	.0211	....	.0212	28,302,000
	800	1,000	.0698	....	.0213		
	16,800	21,000	.0908	.0210	....		
	800	1,000	.0790	....	.0208		
	16,800	21,000	.0911	.0211	....		
	800	1,000	.0699	....	.0212		
190	800	1,000	.0674	....	....		
	16,800	21,000	.0883	....	....		
	800	1,000	.0675	....	.0208		
	16,800	21,000	.0885	.0210	....		
	800	1,000	.0672	....	.0213		
	16,800	21,000	.0882	.0210	....		
	800	1,000	.0672	....	.0210	.0210	28,571,000
	16,800	21,000	.0882	.0210	....		
	800	1,000	.0672	....	.0210		
	16,800	21,000	.0881	.0209	....		
	800	1,000	.0671	....	.0210		

No. 1282—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
150	800	1,000	.0638	....	....	.0214	28,037,000
	16,800	21,000	.0847	....	....		
	800	1,000	.0637	....	.0210		
	16,800	21,000	.0849	.0212	....		
	800	1,000	.0634	....	.0215		
	16,800	21,000	.0843	.0209	....		
	800	1,000	.0632	....	.0211		
	16,800	21,000	.0850	.0218	....		
	800	1,000	.0630	....	.0220		
	16,800	21,000	.0845	.0215	....		
	800	1,000	.0633	....	.0212		
	Rested forty hours at temperature of about 40°.						
68	800	1,000	.0177	....	....	.0209	28,708,000
	16,800	21,000	.0386	....	....		
	800	1,000	.0178	....	.0208		
	16,000	21,000	.0388	.0210	....		
	800	1,000	.0181	....	.0207		
	16,800	21,000	.0390	.0209	....		
	800	1,000	.0180	....	.0210		
	16,800	21,000	.0391	.0211	....		
	800	1,000	.0185	....	.0206		
	16,800	21,000	.0392	.0207	....		
	800	1,000	.0183	....	.0209		
	16,800	21,000	.0393	.0210	....		
	800	1,000	.0185	....	.0208		

Steel.

No. 1296.

Marks, $\frac{8}{782}$
Diameter, 1.″0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
68	24,800	31,000	.1021	....	....	.0312	28,846,000
	800	1,000	.0710	....	.0311		
	24,800	31,000	.1025	.0315	....		
	800	1,000	.0711	....	.0314		
	24,800	31,000	.1024	.0313	....		
	800	1,000	.0712	....	.0312		
	24,800	31,000	.1024	.0312	....		
	800	1,000	.0711	....	.0313		
	24,800	31,000	.1022	.0311	....		
	800	1,000	.0712	....	.0310		
	Observations repeated. Micrometer reset.						
68	24,800	31,000	.1003	....	....	.0308	29,221,000
	800	1,000	.0695	....	.0308		
	24,800	31,000	.1003	.0308	....		
	800	1,000	.0695	....	.0308		
	24,800	31,000	.1004	.0309	....		
	800	1,000	.0696	....	.0308		
	24,800	31,000	.1004	.0308	....		
	800	1,000	.0695	....	.0309		

No. 1296—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Means.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
68	24,800	31,000	.1005	.0310	....		
	800	1,000	.0697	....	.0308		
145	24,800	31,000	.1085	....	....		
	800	1,000	.0774	....	.0311		
	24,800	31,000	.1086	.0312	....		
	800	1,000	.0775	....	.0311		
	24,800	31,000	.1087	.0312	....		
	800	1,000	.0778	....	.0309	.0312	28,846,000
	24,800	31,000	.1092	.0314	....		
	800	1,000	.0781	....	.0311		
	24,800	31,000	.1094	.0313	....		
	800	1,000	.0780	....	.0314		
205	24,800	31,000	.1136	....	....		
	800	1,000	.0820	....	.0316		
	24,800	31,000	.1135	.0315	....		
	800	1,000	.0822	....	.0313		
	24,800	31,000	.1138	.0316	....		
	800	1,000	.0826	....	.0312	.0315	28,571,000
	24,800	31,000	.1140	.0314	....		
	800	1,000	.0827	....	.0313		
	24,800	31,000	.1145	0318	....		
	800	1,000	.0827	....	.0318		
	24,800	31,000	.1145	.0318	....		
	800	1,000	.0830	....	.0315		
250	24,800	31,000	.1175	....	....		
	800	1,000	.0853	....	.0322		
	24,800	31,000	.1172	.0319	....		
	800	1,000	.0856	....	.0316		
	24,800	31,000	.1182	.0326	....		
	800	1,000	.0860	....	.0322	.0320	28,125,000
	24,800	31,000	.1182	.0322	....		
	800	1,000	.0863	....	.0319		
	24,800	31,000	.1184	.0321	....		
	800	1,000	.0867	....	.0317		
300	24,800	31,000	.1225	....	....		
	800	1,000	.0906	....	.0319		
	24,800	31,000	.1230	.0324	....		
	800	1,000	.0907	....	.0323		
	24,800	31,000	.1230	.0323	....		
	800	1,000	.0907	....	.0323	.0324	27,778,000
	24,800	31,000	.1235	.0328	....		
	800	1,000	.0909	....	.0326		
	24,800	31,000	.1235	.0326	....		
	800	1,000	.0910	....	.0325		
350	24,800	31,000	.1275	....	....		
	800	1,000	.0947	....	.0328		
	24,800	31,000	.1278	.0331	....		
	800	1,000	.0949	....	.0329		
	24,800	31,000	.1278	.0329	....		
	800	1,000	.0955	....	.0323	.0328	27,439,000
	24,800	31,000	.1282	.0327	....		
	800	1,000	.0953	....	.0329		
	24,800	31,000	.1283	.0330	....		
	800	1,000	.0956	....	.0327		
400	24,800	31,000	.1310	....	....		
	800	1,000	.0988	....	.0322		
	24,800	31,000	.1310	.0322	....		
	800	1,000	.0992	....	.0318		
	24,800	31,000	.1322	.0330	....		
	800	1,000	.0997	....	.0325		
	24,800	31,000	.1321	.0324	....	.0326	27,608,000
	800	1,000	.0997	....	.0324		
	24,800	31,000	.1325	.0328	....		
	800	1,000	.0997	....	.0328		
	24,800	31,000	.1326	.0329	....		
	800	1,000	.1000	....	.0326		

No. 1296—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity. E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
450	24,800	31,000	.1343	....	....	.0330	27,272,000
	800	1,000	.1021	....	.0323		
	24,800	31,000	.1355	.0334	....		
	800	1,000	.1028	....	.0327		
	24,800	31,000	.1363	.0335	....		
	800	1,000	.1034	....	.0329		
	24,800	31,000	.1363	.0329	....		
	800	1,000	.1035	....	.0328		
	24,800	31,000	.1370	.0335	....		
	800	1,000	.1040	....	.0330		
475	24,800	31,000	.1665	....	....	.0332	27,108,000
	800	1,000	.1340	....	.0325		
	24,800	31,000	.1672	.0332	....		
	800	1,000	.1344	....	.0328		
	24,800	31,000	.1681	.0337	....		
	800	1,000	.1352	....	.0329		
	24,800	31,000	.1689	.0337	....		
	800	1,000	.1356	....	.0333		
	24,800	31,000	.1693	.0337	....		
	800	1,000	.1365	....	.0328		
Temperature allowed to fall slowly. Observations in the mean time taken.							
415	24,800	31,000	.1806	....	....	.0338	26,627,000
	800	1,000	.1473	....	.0333		
	24,800	31,000	.1810	.0337	....		
	800	1,000	.1471	....	.0339		
	24,800	31,000	.1809	.0338	....		
	800	1,000	.1473	....	.0336		
	24,800	31,000	.1810	.0337	....		
	800	1,000	.1471	....	.0339		
	24,800	31,000	.1815	.0344	....		
	800	1,000	.1475	....	.0340		
385	24,800	31,000	.1785	....	....	.0339	26,549,000
	800	1,000	.1447	....	.0338		
	24,800	31,000	.1785	.0338	....		
	800	1,000	.1447	....	.0338		
	24,800	31,000	.1784	.0337	....		
	800	1,000	.1446	....	.0338		
	24,000	31,000	.1784	.0338	....		
	800	1,000	.1443	....	.0341		
	24,800	31,000	.1784	.0341	....		
	800	1,000	.1444	....	.0340		
330	24,800	31,000	.1735	....	....	.0329	27,356,000
	800	1,000	.1411	....	.0324		
	24,800	31,000	.1735	.0324	....		
	800	1,000	.1408	....	.0327		
	24,800	31,000	.1735	.0327	....		
	800	1,000	.1405	....	.0330		
	24,800	31,000	.1733	.0328	....		
	800	1,000	.1403	....	.0330		
	24,800	31,000	.1731	.0328	....		
	800	1,000	.1400	....	.0331		
275	24,800	31,000	.1680	....	....	.0325	27,692,000
	800	1,000	.1355	....	.0325		
	24,800	31,000	.1678	.0323	....		
	800	1,000	.1352	....	.0326		
	24,800	31,000	.1679	.0327	....		
	800	1,000	.1352	....	.0327		
	24,800	31,000	.1677	.0325	....		
	800	1,000	.1350	....	.0327		
	24,800	31,000	.1672	.0322	....		
	800	1,000	.1349	....	.0323		
Rested fifteen hours.							
68	24,800	31,000	.1491	....	....		
	800	1,000	.1175	....	.0316		
	24,800	31,000	.1490	.0315	....		

No. 1296—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity. E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
68	800	1,000	.1174		.0316		
	24,800	31,000	.1490	.0316			
	800	1,000	.1176		.0314	.0316	28,481,000
	24,800	31,000	.1490	.0314			
	800	1,000	.1172		.0318		
	24,800	31,000	.1489	.0317			
	800	1,000	.1173		.0316		
Micrometer re-set and observations taken.							
68	24,800	31,000	.1473				
	800	1,000	.1162		.0311		
	24,800	31,000	.1472	.0310			
	800	1,000	.1163		.0309		
	24,800	31,000	.1472	.0309			
	800	1,000	.1163		.0309	.0309	29,126,000
	24,800	31,000	.1471	.0308			
	800	1,000	.1164		.0307		
	24,800	31,000	.1472	.0308			
	800	1,000	.1162		.0310		

Steel.

No. 1297.

Marks, $\frac{4}{795}$
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity. E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
68	24,800	31,000	.0511				
	800	1,000	.0211		.0300		
	24,800	31,000	.0513	.0302			
	800	1,000	.0210		.0303		
	24,800	31,000	.0513	.0303			
	800	1,000	.0212		.0301	.0302	29,801,000
	24,800	31,000	.0513	.0301			
	800	1,000	.0211		.0302		
	24,800	31,000	.0514	.0303			
	800	1,000	.0208		.0306		
165	24,800	31,000	.0621				
	800	1,000	.0301		.0320		
	24,800	31,000	.0620	.0319			
	800	1,000	.0306		.0314		
	24,800	31,000	.0621	.0315			
	800	1,000	.0303		.0318	.0316	28,481,000
	24,800	31,000	.0623	.0320			
	800	1,000	.0310		.0313		
	24,800	31,000	.0621	.0311			
	800	1,000	.0307		.0314		
250	24,800	31,000	.0693				
	800	1,000	.0375		.0318		
	24,800	31,000	.0699	.0324			
	800	1,000	.0376		.0323		
	24,800	31,000	.0700	.0324			
	800	1,000	.0379		.0321	.0322	27,950,000
	24,800	31,000	.0702	.0323			
	800	1,000	.0380		.0322		

No. 1297—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
250	24,800	31,000	.0702	.0322			
	800	1,000	.0381		.0321		
315	24,800	31,000	.0749				
	800	1,000	.0430		.0319		
	24,800	31,000	.0752	.0322			
	800	1,000	.0430		.0322		
	24,800	31,000	.0752	.0322			
	800	1,000	.0432		.0320	.0321	28,037,000
	24,800	31,000	.0755	.0323			
	800	1,000	.0436		.0319		
	24,800	31,000	.0756	.0320			
	800	1,000	.0434		.0322		
365	24,800	31,000	.0784				
	800	1,000	.0457		.0327		
	24,800	31,000	.0789	.0332			
	800	1,000	.0464		.0325		
	24,800	31,000	.0792	.0328			
	800	1,000	.0462		.0300	.0325	27,692,000
	24,800	31,000	.0791	.0329			
	800	1,000	.0468		.0323		
	24,800	31,000	.0797	.0329			
	800	1,000	.0465		.0332		
405	24,800	31,000	.0824				
	800	1,000	.0496		.0328		
	24,800	31,000	.0825	.0329			
	800	1,000	.0498		.0327		
	24,800	31,000	.0827	.0329			
	800	1,000	.0499		.0328	.0327	27,523,000
	24,800	31,000	.0827	.0328			
	800	1,000	.0503		.0324		
	24,800	31,000	.0828	.0325			
	800	1,000	.0500		.0328		
475	24,800	31,000	.0948				
	800	1,000	.0623		.0325		
	24,800	31,000	.0951	.0328			
	800	1,000	.0626		.0325		
	24,800	31,000	.0953	.0327			
	800	1,000	.0631		.0322	.0326	27,606,000
	24,800	31,000	.0954	.0323			
	800	1,000	.0628		.0326		
	24,800	31,000	.0957	.0329			
	800	1,000	.0632		.0325		
400	24,800	31,000	.0893				
	800	1,000	.0572		.0321		
	24,800	31,000	.0893	.0321			
	800	1,000	.0568		.0325		
	24,800	31,000	.0889	.0321			
	800	1,000	.0566		.0323	.0321	28,037,000
	24,800	31,000	.0887	.0321			
	800	1,000	.0565		.0322		
	24,800	31,000	.0883	.0318			
	800	1,000	.0562		.0321		
68	24,800	31,000	.0597				
	800	1,000	.0285		.0312		
	24,800	31,000	.0594	.0309			
	800	1,000	.0286		.0308		
	24,800	31,000	.0595	.0309			
	800	1,000	.0285		.0310	.0309	29,126,000
	24,800	31,000	.0593	.0308			
	800	1,000	.0288		.0305		
	24,800	31,000	.0600	.0312			
	800	1,000	.0287		.0313		

Steel.

No. 1281.

Marks, $\frac{5}{803}$
Diameter, 1''.0092.
Sectional area, .80 square inch.
Gauged length, 30''.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
80	800	1,000	.0624	....	....		
	32,800	41,000	.1034	....	....		
	800	1,000	.0628	....	.0406		
	32,800	41,000	.1033	.0405	....		
	800	1,000	.0625	....	.0408		
	32,800	41,000	.1024	.0399	....		
	800	1,000	.0628	....	.0396	.0405	29,630,000
	32,800	41,000	.1034	.0406	....		
	800	1,000	.0623	....	.0411		
	32,800	41,000	.1034	.0411	....		
	800	1,000	.0628	....	.0406		
125	800	1,000	.0557	....	....		
	32,800	41,000	.0962	....	....		
	8 0	1,000	.0558	....	.0404		
	32,800	41,0 0	.0967	.0409	....		
	800	1,000	.0561	....	.0406		
	32,800	41,000	.0965	.0404	....		
	800	1,000	.0561	....	.0404		
	32,800	41,000	.0970	.0409	....	.0409	29,337,000
	800	1,000	.0551	....	.0419		
	32,800	41,000	.0074	.0423	....		
	800	1,000	.0568	....	.0406		
200	800	1,000	.0483	....	....		
	32,800	41,000	.0883	....	....		
	800	1,000	.0472	....	.0411		
	32,800	41,000	.0877	.0405	....		
	800	1,000	.0468	....	.0409		
	32,800	41,000	.0880	.0412	....		
	800	1,000	.0464	....	.0416	.0409	29,337,000
	32,800	41,000	.0873	.0409	....		
	800	1,000	.0464	....	.0409		
	32,800	41,000	.0868	.0404	....		
	800	1,000	.0458	....	.0410		
250	800	1,000	.0505	....	....		
	32,800	41,000	.0919	....	....		
	800	1,000	.0505	....	.0414		
	32,800	41,000	.0910	.0405	....		
	800	1,000	.0503	....	.0407		
	32,800	41,000	.0909	.0406	....		
	800	1,000	.0500	....	.0409	.0411	29,197,000
	32,800	41,000	.0910	.0410	....		
	800	1,000	.0495	....	.0415		
	32,800	41,000	.0908	.0413	....		
	800	1,000	.0490	....	.0418		
300	800	1,000	.0521	....	....		
	32,800	41,000	.0945	....	....		
	800	1,000	.0520	....	.0425		
	32,800	41,000	.0942	.0422	....		
	800	1,000	.0512	....	.0430		
	32,800	41,000	.0925	.0413	....		
	800	1,000	.0503	....	.0422	.0421	28,504,000
	32,800	41,000	.0915	.0412	....		
	800	1,000	.0190	....	.0425		
	32,800	41,000	.0907	.0417	....		
	800	1,000	.0485	....	.0422		
350	800	1,000	.0518	....	....		
	32,800	41,000	.0919	....	....		
	800	1,000	.0487	....	.0432		
	32,800	41,000	.0903	.0416	....		
	800	1,000	.0472	....	.0431		
	32,800	41,000	.0897	.0425	....		
	600	1,000	.0463	....	.0434	.0426	28,169,000
	32,800	41,000	.0885	.0122	....		

No. 1281—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
350	800	1,000	.0454	....	.0431		
	32,800	41,000	.0874	.0420	....		
	800	1,000	.0448	....	.0426		
400	800	1,000	.0524	....	....		
	32,800	41,000	.0939	....	....		
	800	1,000	.0500	....	.0439		
	32,800	41,000	.0925	.0425	....		
	800	1,000	.0490	....	.0435		
	32,800	41,000	.0907	.0417	....		
	800	1,000	.0474	....	.0433	.0433	27,714,000
	32,800	41,000	.0905	.0431	....		
	800	1,000	.0460	....	.0445		
	32,800	41,000	.0889	.0429	....		
	800	1,000	.0448	....	.0441		
470	800	1,000	.0430	....	....		
	32,800	41,000	.0860	....	....		
	800	1,000	.0419	....	.0441		
	32,800	41,000	.0852	.0433	....		
	800	1,000	.0403	....	.0449		
	32,800	41,000	.0836	.0433	....	.0441	27,211,000
	800	1,000	.0387	....	.0449		
	32,800	41,000	.0817	.0430	....		
	800	1,000	.0367	....	.0450		
	32,800	41,000	.0800	.0433	....		
	800	1,000	.0350	....	.0450		

Steel.

No. 1298.

Marks, $\frac{6}{797}$
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
80	32,800	41,000	.0711	....	....		
	800	1,000	.0311	....	.0400		
	32,800	41,000	.0710	.0399	....		
	800	1,000	.0313	....	.0397		
	32,800	41,000	.0715	.0402	....		
	800	1,000	.0313	....	.0402	.0400	30,000,000
	32,800	41,000	.0712	.0399	....		
	800	1,000	.0313	....	.0399		
	32,800	41,000	.0712	.0399	....		
	800	1,000	.0313	....	.0399		
185	32,800	41,000	.0774	....	....		
	800	1,000	.0370	....	.0404		
	32,800	41,000	.0776	.0406	....		
	800	1,000	.0371	....	.0405		
	32,800	41,000	.0776	.0405	....		
	800	1,000	.0373	....	.0403	.0406	29,556,000
	32,800	41,000	.0779	.0406	....		
	800	1,000	.0373	....	.0406		
	32,800	41,000	.0783	.0410	....		
	800	1,000	.0376	....	.0407		

No. 1298—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
210	32,800	41,000	.0820	....	....		
	800	1,000	.0410	....	.0410		
	32,800	41,000	.0825	.0415	....		
	800	1,000	.0415	....	.0410		
	32,800	41,000	.0827	.0412	....		
	800	1,000	.0409	....	.0418	.0412	29,126,000
	32,800	41,000	.0825	.0416	....		
	800	1,000	.0418	....	.0407		
	32,800	41,000	.0830	.0412	....		
	800	1,000	.0418	....	.0412		
265	32,800	41,000	.0863	....	....		
	800	1,000	.0455	....	.0408		
	32,800	41,000	.0870	.0415	....		
	800	1,000	.0461	....	.0409		
	32,800	41,000	.0874	.0413	....		
	800	1,000	.0459	....	.0415	.0415	28,916,000
	32,800	41,000	.0877	.0418	....		
	800	1,000	.0457	....	.0420		
	32,800	41,000	.0880	.0423	....		
	800	1,000	.0465	....	.0415		
335	32,800	41,000	.0912	....	....		
	800	1,000	.0493	....	.0419		
	32,800	41,000	.0914	.0421	....		
	800	1,000	.0498	....	.0416		
	32,800	41,000	.0918	.0420	....		
	800	1,000	.0496	....	.0422	.0421	28,504,000
	32,800	41,000	.0920	.0424	....		
	800	1,000	.0496	....	.0424		
	32,800	41,000	.0920	.0424	....		
	800	1,000	.0501	....	.0419		
405	32,800	41,000	.1024	....	....		
	800	1,000	.0608	....	.0416		
	32,800	41,000	.1030	.0422	....		
	800	1,000	.0610	....	.0420		
	32,000	41,000	.1035	.0425	....		
	000	1,000	.0607	....	.0428	.0425	28,235,000
	32,800	41,000	.1038	.0431	....		
	800	1,000	.0611	....	.0427		
	32,800	41,000	.1039	.0428	....		
	800	1,000	.0610	....	.0429		
465	32,800	41,000	.1090	....	....		
	800	1,000	.0663	....	.0427		
	32,800	41,000	.1096	.0433	....		
	800	1,000	.0674	....	.0422		
	32,800	41,000	.1102	.0428	....		
	800	1,000	.0677	....	.0425	.0427	28,103,000
	32,800	41,000	.1104	.0427	....		
	800	1,000	.0679	....	.0425		
	32,800	41,000	.1109	.0430	....		
	800	1,000	.0679	....	.0430		
410	32,800	41,000	.1041	....	....		
	800	1,000	.0611	....	.0430		
	32,800	41,000	.1038	.0427	....		
	800	1,000	.0610	....	.0428		
	32,800	41,000	.1036	.0426	....		
	800	1,000	.0610	....	.0426	.0424	28,302,000
	32,800	41,000	.1027	.0417	....		
	800	1,000	.0603	....	.0424		
	32,800	41,000	.1019	.0416	....		
	800	1,000	.0594	....	.0425		
290	32,800	41,000	.0926	....	....		
	800	1,000	.0506	....	.0420		
	32,800	41,000	.0929	.0423	....		
	800	1,000	.0506	....	.0423		
	32,800	41,000	.0927	.0421	....		
	800	1,000	.0508	....	.0419	.0419	28,640,000
	32,800	41,000	.0924	.0416	....		
	800	1,000	.0504	....	.0420		
	32,800	41,000	.0919	.0415	....		
	800	1,000	.0506	....	.0413		

Steel.

No. 1299.

Marks, $\frac{7}{825}$
Diameter, 1″.0092.
Sectional area, 80 square inch.
Gauged length, 30″.

Temperature (degrees Fahr).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
74	32,800	41,000	.0658	....	....		
	800	1,000	.0252	....	.0406		
	32,800	41,000	.0658	.0406	....		
	800	1,000	.0255	....	.0403		
	32,800	41,000	.0655	.0400	....		
	800	1,000	.0256	....	.0399	.0402	29,851,000
	32,800	41,000	.0654	.0398	....		
	800	1,000	.0254	....	.0400		
	32,800	41,000	.0655	.0401	....		
	800	1,090	.0255	....	.0400		
200	32,800	41,000	.0775	....	....		
	800	1,000	.0367	....	.0408		
	32,800	41,000	.0772	.0405	....		
	800	1,000	.0365	....	.0407		
	32,800	41,000	.0780	.0415	....		
	800	1,000	.0372	....	.0408	.0408	29,411,000
	32,800	41,000	.0785	.0413	....		
	800	1,000	.0375	....	.0410		
	32,800	41,000	.0780	.0405	....		
	800	1,000	.0375	....	.0405		
300	32,800	41,000	.0864	....	....		
	800	1,000	.0455	....	.0409		
	32,800	41,000	.0864	.0409	....		
	800	1,000	.0454	....	.0410		
	32,800	41,000	.0875	.0421	....		
	800	1,000	.0460	....	.0415	.0411	29,197,000
	32,800	41,000	.0870	.0410	....		
	800	1,000	.0463	....	.0407		
	32,800	41,000	.0871	.0408	....		
	800	1,000	.0459	....	.0412		
400	32,800	41,000	.0956	....	....		
	800	1,000	.0540	....	.0416		
	32,800	41,000	.0959	.0419	....		
	800	1,000	.0543	....	.0416		
	32,800	41,000	.0962	.0419	....		
	800	1,000	.0548	....	.0414	.0417	28,777,000
	32,800	41,000	.0966	.0418	....		
	800	1,000	.0552	....	.0414		
	32,800	41,000	.0970	.0418	....		
	800	1,000	.0552	....	.0418		
480	32,800	41,000	.1045	....	....		
	800	1,000	.0623	....	.0422		
	32,800	41,000	.1055	.0432	....		
	800	1,000	.0638	....	.0417		
	32,800	41,000	.1067	.0429	....		
	800	1,000	.0643	....	.0424	.0425	28,236,000
	32,800	41,000	.1072	.0429	....		
	800	1,000	.0649	....	.0423		
	32,800	41,000	.1073	.0424	....		
	800	1,000	.0649	....	.0424		
130	32,800	41,000	.0766	....	....		
	800	1,000	.0353	....	.0413		
	32,800	41,000	.0766	.0413	....		
	800	1,000	.0351	....	.0415		
	32,800	41,000	.0764	.0413	....		
	800	1,000	.0854	....	.0410	.0412	29,126,000
	32,800	41,000	.0765	.0411	....		
	800	1,000	.0354	....	.0411		
	32,800	41,000	.0766	.0412	....		
	800	1,000	.0355	....	.0411		

Steel.

No. 1300.

Marks, $\frac{8}{750}$
Diameter, 1''.0092.
Sectional area, ''.80 square inch.
Gauged length, 30''.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity. E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
76	40,800	51,000	.0756	....	....		
	800	1,000	.0251	....	.0505		
	40,800	51,000	.0756	.0505	....		
	800	1,000	.0251	....	.0505		
	40,800	51,000	.0756	.0505	....		
	800	1,000	.0251	....	.0505	.0505	29,703,000
	40,800	51,000	.0757	.0506	....		
	800	1,000	.0252	....	.0505		
	40,800	51,000	.0756	.0504	....		
	800	1,000	.0255	....	.0501		
210	40,800	51,000	.0875	....	....		
	800	1,000	.0361	....	.0514		
	40,800	51,000	.0877	.0516	....		
	800	1,000	.0361	....	.0516		
	40,800	51,000	.0882	.0521	....		
	800	1,000	.0368	....	.0514	.0516	29,070,000
	40,800	51,000	.0882	.0514	....		
	800	1,000	.0366	....	.0516		
	40,800	51,000	.0881	.0515	....		
	800	1,000	.0365	....	.0516		
300	40,800	51,000	.0938	....	....		
	800	1,000	.0420	....	.0518		
	40,800	51,000	.0947	.0527	....		
	800	1,000	.0423	....	.0524		
	40,800	51,000	.0946	.0523	....		
	800	1,000	.0428	....	.0518	.0522	28,736,000
	40,800	51,000	.0951	.0523	....		
	800	1,000	.0432	....	.0519		
	40,800	51,000	.0956	.0524	....		
	800	1,000	.0434	....	.0522		
400	40,800	51,000	.1017	....	....		
	800	1,000	.0490	....	.0527		
	40,800	51,000	.1023	.0533	....		
	800	1,000	.0503	....	.0520		
	40,800	51,000	.1031	.0528	....		
	800	1,000	.0505	....	.0526	.0528	28,409,000
	40,800	51,000	.1037	.0532	....		
	800	1,000	.0507	....	.0530		
	40,800	51,000	.1040	.0533	....		
	800	1,000	.0513	....	.0527		
470	40,800	51,000	.1079	....	....		
	800	1,000	.0551	....	.0528		
	40,800	51,000	.1093	.0542	....		
	800	1,000	.0559	....	.0534		
	40,800	51,000	.1098	.0539	....		
	800	1,000	.0563	....	.0535	.0535	28,037,000
	40,800	51,000	.1100	.0537	....		
	800	1,000	.0567	....	.0533		
	40,800	51,000	.1103	.0536	....		
	800	1,000	.0568	....	.0535		

Steel.

No. 1301.

Marks, $\frac{9}{756}$
Diameter, 1″.0092.
Sectional area, .80 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
80	40, 800	51, 000	.0740	....	....	.0498	30, 120, 000
	800	1, 000	.0242	....	.0498		
	40, 800	51, 000	.0740	.0498	....		
	800	1, 000	.0245	....	.0495		
	40, 800	51, 000	.0740	.0495	....		
	800	1, 000	.0242	....	.0498		
	40, 800	51, 000	.0743	.0501	....		
	800	1, 000	.0242	....	.0501		
	40, 800	51, 000	.0739	.0497	....		
	800	1, 000	.0242	....	.0497		
200	40, 800	51, 000	.0839	....	....	.0509	29, 470, 000
	800	1, 000	.0336	....	.0503		
	40, 000	51, 000	.0845	.0509	....		
	800	1, 000	.0343	....	.0502		
	40, 800	51, 000	.0852	.0509	....		
	800	1, 000	.0345	....	.0507		
	40, 800	51, 000	.0860	.0515	....		
	800	1, 000	.0348	....	.0512		
	40, 800	51, 000	.0861	.0513	....		
	800	1, 000	.0349	....	.0512		
300	40, 800	51, 000	.0919	....	....	.0517	29, 014, 000
	800	1, 000	.0404	....	.0515		
	40, 800	51, 000	.0926	.0522	....		
	800	1, 000	.0410	....	.0516		
	40, 800	51, 000	.0930	.0520	....		
	800	1, 000	.0418	....	.0512		
	40, 800	51, 000	.0932	.0514	....		
	800	1, 000	.0417	....	.0515		
	40, 800	51, 000	.0938	.0521	....		
	800	1, 000	.0420	....	.0518		
400	40, 800	51, 000	.1008	....	....	.0527	28, 463, 000
	800	1, 000	.0485	....	.0523		
	40, 800	51, 000	.1013	.0528	....		
	800	1, 000	.0488	....	.0525		
	40, 800	51, 000	.1017	.0529	....		
	800	1, 000	.0488	....	.0529		
	40, 800	51, 000	.1017	.0529	....		
	800	1, 000	.0490	....	.0527		
	40, 800	51, 000	.1019	.0529	....		
	800	1, 000	.0491	....	.0528		
470	40, 800	51, 000	.1098	....	....	.0530	28, 302, 000
	800	1, 000	.0575	....	.0523		
	40, 800	51, 000	.1107	.0532	....		
	800	1, 000	.0580	....	.0527		
	40, 800	51, 000	.1113	.0533	....		
	800	1, 000	.0586	....	.0527		
	40, 600	51, 000	.1119	.0533	....		
	800	1, 000	.0589	....	.0530		
	40, 800	51, 000	.1120	.0531	....		
	800	1, 000	.0590	....	.0530		

Steel.

No. 1280.

Marks, $\frac{10}{834}$
Diameter, .1″0092.
Sectional area, .80 square inch.
Gauged length, 30.″

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
80	800	1,000	.0374	....	....		
	16,800	21,000	.0583	....	....		
	800	1,000	.0371	....	.0212		
	16,800	21,000	.0585	.0214	....		
	800	1,000	.0382	....	.0203	.0206	29,126,000
	16,800	21,000	.0587	.0205	....		
	800	1,000	.0384	....	.0203		
	16,800	21,000	.0587	.0203	....		
	800	1,000	.0383	....	.0204		
80	800	1,000	.0384	....	....		
	32,800	41,000	.0794	....	....		
	800	1.000	.0387	....	.0407		
	32,000	41,000	.0799	.0412	....		
	800	1,000	.0383	....	.0416	.0411	29,197,000
	32,000	41,000	.0795	.0412	....		
	800	1,000	.0387	....	.0408		
115	800	1,000	.0350	....	....		
	32,800	41,000	.0787	....	....		
	800	1,000	.0375	....	.0412		
	32,800	41,000	.0786	.0411	....		
	800	1,000	.0380	....	.0406	.0410	29,268,000
	32,800	41,000	.0793	.0413	....		
	800	1,000	.0386	....	.0407		
	32,000	41,000	.0795	.0409	....		
	800	1,000	.0886	....	.0409		
200	800	1,000	.0294	....	....		
	32,800	41,000	.0703	....	....		
	800	1,000	.0283	....	.0420		
	32,800	41,000	.0698	.0415	....		
	800	1,000	.0277	....	.0421	.0418	28,708,000
	32,800	41,000	.0690	.0413	....		
	800	1,000	.0272	....	.0418		
	32,800	41,000	.0691	.0419	....		
	800	1,000	.0274	....	.0417		
250	800	1,000	.0314	....	....		
	32,800	41,000	.0737	....	....		
	800	1,000	.0312	....	.0425		
	32,800	41,000	.0733	.0421	....		
	600	1,000	.0311	....	.0422	.0421	28,504,000
	32,800	41,000	.0726	.0415	....		
	800	1,000	.0305	....	.0421		
	32,800	41,000	.0723	.0418	....		
	800	1,000	.0301	....	.0422		
300	800	1,000	.0438	....	....		
	32,800	41,000	.0860	....	....		
	800	1,000	.0428	....	.0432		
	32,800	41,000	.0845	.0417	....		
	800	1,000	.0418	....	.0427	.0425	28,235,000
	32,800	41,000	.0840	.0422	....		
	800	1,000	.0412	....	.0428		
	32,800	41,000	.0830	.0418	....		
	800	1,000	.0401	....	.0429		
355	800	1,000	.0445	....	....		
	32,800	41,000	.0865	....	....		
	800	1,000	.0433	....	.0432		
	32,800	41,000	.0860	.0427	....		
	800	1,000	.0426	....	.0434		
	32,800	41,000	0856	.0430	....		
	800	1,000	.0415	....	.0441	.0431	27,842,000

No. 1280—Continued.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
355	32,800	41,000	.0837	.0422	....		
	800	1,000	.0405	....	.0432		
	32,000	41,000	.0827	.0422	....		
	800	1,000	.0392	....	.0435		
400	800	1,000	.0918	....	....		
	32,800	41,000	.1332	....	....		
	800	1,000	.0894	....	.0438		
	32,800	41,000	.1315	.0421	....		
	800	1,000	.0877	....	.0438		
	32,800	41,000	.1300	.0423	....		
	800	1,000	.0864	....	.0436	.0431	27,842,000
	32,800	41,000	.1286	.0422	....		
	800	1,000	.0848	....	.0438		
	32,800	41,000	.1274	.0426	....		
	800	1,000	.0837	....	.0437		
455	800	1,000	.0667	....	....		
	32,000	41,000	.1091	....	....		
	800	1,000	.0655	....	.0436		
	32,800	41,000	.1076	.0421	....		
	800	1,000	.0638	....	.0438		
	32,800	41,060	.1060	.0422	....		
	800	1,000	.0624	....	.0436	.0432	27,778,000
	32,800	41,000	.1044	.0420	....		
	800	1,000	.0606	....	.0438		
	32,800	41,000	.1036	.0430	....		
	800	1,000	.0592	....	.0444		
	51,000	63,750	....	....	....		

Cast gun iron.

No. 1335.

Mark, 1.
Diameter, 1″.129.
Sectional area, 1. square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity. E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
82	1,000	1,000	0.	....	....		Initial load.
	5,000	5,000	.0077	....	....		
	1,000	1,000	0.	....	....		
	10,000	10,000	.0184	....	....		
	1,000	1,000	.0012	....	....		
	15,000	15,000	.0324	....	....		
	1,000	1,000	.0038	....	....		
	18,000	18,000	.0438	....	....		
	1,000	1,000	.0082	....	....		
	5,000	5,000	.0160	.0078	....		
	10,000	10,000	.0265	.0105	....		
	15,000	15,000	.0370	.0105	....		
	1,000	1,000	.0080	.0290	....	....	14,483,000
170	15,000	15,000	.0456	....	....		
	1,000	1,000	.0164	....	.0292		
	15,000	15,000	.0464	.0300	....		

No. 1335—Continued.

Temperature (degrees Fahr).	Applied loads		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
170	1,000	1,000	.0168	....	.0296		
	15,000	15,000	.0465	.0297	....		
	1,000	1,000	.0168	....	.0297	.0296	14,189,000
	15,000	15,000	.0465	.0297	....		
	1,000	1,000	.0171	....	.0294		
	15,000	15,000	.0470	.0299	....		
	1,000	1,000	.0174	....	.0296		
265	15,000	15,000	.0515	....	....		
	1,000	1,000	.0217	....	.0298		
	15,000	15,000	.0522	.0305	....		
	1,000	1,000	.0223	....	.0299		
	15,000	15,000	.0529	.0306	....		
	1,000	1,000	.0230	....	.0299	.0302	13,907,000
	15,000	15,000	.0536	.0306	....		
	1,000	1,000	.0233	....	.0303		
	15,000	15,000	.0537	.0304	....		
	1,000	1,000	.0237	....	.0300		
370	15,000	15,000	.0602	....	....		
	1,000	1,000	.0305	....	.0297		
	15,000	15,000	.0611	.0306	....		
	1,000	1,000	.0312	....	.0299		
	15,000	15,000	.0613	.0301	....		
	1,000	1,000	.0313	....	.0300	.0302	13,907,000
	15,000	15,000	.0618	.0305	....		
	1,000	1,000	.0314	....	.0304		
	15,000	15,000	.0618	.0304	....		
	1,000	1,000	.0314	....	.0304		
472	15,000	15,000	.0665	....	....		
	1,000	1,000	.0373	....	.0292		
	15,000	15,000	.0674	.0301	....		
	1,000	1,000	.0373	....	.0301		
	15,000	15,000	.0674	.0301	....		
	1,000	1,000	.0375	....	.0299	.0301	13,953,000
	15,000	15,000	.0682	.0307	....		
	1,000	1,000	.0381	....	.0301		
	15,000	15,600	.0686	.0305	....		
	1,000	1,000	.0384	....	.0302		
350	15,000	15,000	.0594	....	....		
	1,000	1,000	.0293	....	.0301		
	15,000	15,000	.0590	.0297	....		
	1,000	1,000	.0294	....	.0296		
	15,000	15,000	.0589	.0295	....		
	1,000	1,000	.0294	....	.0295	.0298	14,094,000
	15,000	15,000	.0592	.0298	....		
	1,000	1,000	.0291	....	.0301		
	15,000	15,000	.0593	.0302	....		
	1,000	1,000	.0293	....	.0300		
168	15,000	15,000	.0458	....	....		
	1,000	1,000	.0167	....	.0291		
	15,000	15,000	.0456	.0289	....		
	1,000	1,000	.0167	....	.0289		
	15,000	15,000	.0454	.0287	....		
	1,000	1,000	.0163	....	.0291	.0290	14,483,000
	15,000	15,000	.0455	.0292	....		
	1,000	1,000	.0162	....	.0293		
	15,000	15,000	.0451	.0289	....		
	1,000	1,000	.0162	....	.0289		
82	15,000	15,000	.0378	....	....		
	1,000	1,000	.0093	....	.0285		
	15,000	15,000	.0378	.0285	....		
	1,000	1,000	.0091	....	.0287		
	15,000	15,000	.0379	.0288	....		
	1,000	1,000	.0092	....	.0287	.0287	14,684,000
	15,000	15,000	.0378	.0286	....		
	1,000	1,000	.0094	....	.0284		
	15,000	15,000	.0383	.0289	....		
	1,000	1,000	.0094	....	.0289		

Cast gun iron.

No. 1336.

Marks, 2.
Diameter, 1″.129.
Sectional area, 1 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
82	1,000	1,000	0.	0.	0.		
	5,000	5,000	.0072	....	....	....	Initial load.
	1,000	1,000	0.	....	....		
	10,000	10,000	.0182	....	....		
	1,000	1,000	.0009	....	....		
	15,000	15,000	.0324	....	....		
	1,000	1,000	.0037	....	....		
	18,000	18,000	.0446	....	....		
	1,000	1,000	.0082	....	....		
	15,000	15,000	.0367	....	....		
	1,000	1,000	.0076	....	.0291		
	15,000	15,000	.0366	.0290	....		
	1,000	1,000	.0076	....	.0290		
	15,000	15,000	.0369	.0293	....		
	1,000	1,000	.0080	....	.0289	.0291	14,434,000
	15,000	15,000	.0370	.0290	....		
	1,000	1,000	.0080	....	.0290		
	15,000	15,000	.0372	.0292	....		
	1,000	1,000	.0082	....	.0290		
205	15,000	15,000	.0490	....	....		
	1,000	1,000	.0190	....	.0300		
	15,000	15,000	.0490	.0300	....		
	1,000	1,000	.0195	....	.0295		
	15,000	15,000	.0498	.0303	....		
	1,000	1,000	.0198	....	.0300	.0301	13,953,000
	15,000	15,000	.0499	.0301	....		
	1,000	1,000	.0199	....	.0300		
	15,000	15,000	.0504	.0305	....		
	1,000	1,000	.0200	....	.0304		
335	15,000	15,000	.0584	....	....		
	1,000	1,000	.0288	....	.0296		
	15,000	15,000	.0588	.0300	....		
	1,000	1,000	.0288	....	.0300		
	15,000	15,000	.0587	.0299	....		
	1,000	1,000	.0287	....	.0300	.0300	14,000,000
	15,000	15,000	.0591	.0304	....		
	1,000	1,000	.0291	....	.0300		
	15,000	15,000	.0593	.0302	....		
	1,000	1,000	.0295	....	.0298		
475	15,000	15,000	.0692	....	....		
	1,000	1,000	.0382	....	.0310		
	15,000	15,000	.0690	.0308	....		
	1,000	1,000	.0385	....	.0305		
	15,000	15,000	.0695	.0310	....		
	1,000	1,000	.0382	....	.0313	.0311	13,505,000
	15,000	15,000	.0694	.0312	....		
	1,000	1,000	.0384	....	.0310		
	15,000	15,000	.0697	.0313	....		
	1,000	1,000	.0382	....	.0315		
Final readings taken twenty-four hours after the readings under the maximum temperature, 475°.							
82	15,000	15,000	.0343	....	....		
	1,000	1,000	.0062	....	.0281		
	15,000	15,000	.0343	.0281	....		
	1,000	1,000	.0063	....	.0280		
	15,000	15,000	.0344	.0281	....		
	1,000	1,000	.0062	....	.0282	.0282	14,894,000
	15,000	15,000	.0345	.0283	....		
	1,000	1,000	.0062	....	.0283		
	15,000	15,000	.0346	.0284	....		
	1,000	1,000	.0063	....	.0283		

Modulus of Elasticity &c.

Cast gun iron.

No. 1337.

Marks, 3.
Diameter, 1″.129.
Sectional area, 1 square inch.
Gauged length, 30″.

Temperature (degrees Fahr.).	Applied loads.		Elongation.	Differences.			Modulus of elasticity E.
	Total.	Per square inch.		Ascending.	Descending.	Mean.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Pounds.*
496	1,000	1,000	.0342	....	....	....	Initial load.
	5,000	5,000	.0424	....	....		
	1,000	1,000	.0341	....	....		
	10,000	10,000	.0538	....	....		
	1,000	1,000	.0347	....	....		
	15,000	15,000	.0664	....	....		
	1,000	1,000	.0378	....	....		
	18,000	18,000	.0785	....	....		
	1,000	1,000	.0419	....	....		
490	15,000	15,000	.0722	....	....		
	1,000	1,000	.0417	....	.0305		
	15,000	15,000	.0721	.0304	....		
	1,000	1,000	.0420	....	.0301		
	15,000	15,000	.0720	.0300	....		
	1,000	1,000	.0417	....	.0303	.0303	13,861,000
	15,000	15,000	.0723	.0306	....		
	1,000	1,000	.0420	....	.0303		
	15,000	15,000	.0723	.0303	....		
	1,000	1,000	.0420	....	.0303		
380	15,000	15,000	.0625	....	....		
	1,000	1,000	.0332	....	.0293		
	15,000	15,000	.0624	.0292	....		
	1,000	1,000	.0335	....	.0289		
	15,000	15,000	.0628	.0293	....		
	1,000	1,000	.0339	....	.0289		
	15,000	15,000	.0625	.0286	....	.0293	14,334,000
	1,000	1,000	.0331	....	.0294		
	15,000	15,000	.0627	.0296	....		
	1,000	1,000	.0326	....	.0301		
	15,000	15,000	.0624	.0298	....		
	1,000	1,000	.0329	....	.0295		
220	15,000	15,000	.0491	....	....		
	1,000	1,000	.0215	....	.0276		
	15,000	15,000	.0488	.0273	....		
	1,000	1,000	.0215	....	.0273		
	15,000	15,000	.0488	.0273	....		
	1,000	1,000	.0212	....	.0276	.0274	15,328,000
	15,000	15,000	.0488	.0276	....		
	1,000	1,000	.0218	....	.0270		
	15,000	15,000	.0488	.0270	....		
	1,000	1,000	.0212	....	.0276		
70	15,000	15,000	.0338	....	....		
	1,000	1,000	.0070	....	.0268		
	15,000	15,000	.0339	.0269	....		
	1,000	1,000	.0071	....	.0268		
	15,000	15,000	.0343	.0272	....		
	1,000	1,000	.0077	....	.0269	.0269	15,613,000
	15,000	15,000	.0348	.0271	....		
	1,000	1,000	.0079	....	.0269		
	15,000	15,000	.0350	.0271	....		
	1,000	1,000	.0079	....	.0271		

SPECIFIC GRAVITY DETERMINATIONS.

The partial results of an investigation in progress relating to the changes which occur in the specific gravity of steel specimens when subjected to different kinds of treatment are herewith reported.

It is the purpose of this investigation to ascertain what effects are produced by tensile and compression stresses at different stages between the elastic limit of the metal and final rupture; also cubic compression and the operations of hardening, tempering, and annealing, carrying on the tests with the same grades of steel represented in the temperature series of experiments.

To ascertain the effect of free compression, cylinders were prepared about ″.80 diameter by 1″ long, which were compressed between other cylinders of the same dimensions and grade of metal.

Cylinders were taken from the stems of tensile specimens after different loads had been applied, and after the specific gravities were determined the same pieces were subjected to compressive stresses.

The weighing was done with a chemical balance sensitive to $\frac{1}{10}$ milligramme when weighing in air. The results are corrected by means of Hassler's table to compare with distilled water at the temperature of 60° Fahrenheit.

Barometrical observations were not taken.

The first set of observations on the first to the fourth specimens of a kind show the specific gravities found in the 1¼″ diameter hot-rolled bars. The other observations were made after the metal had been treated in some manner.

An examination of the results shows that the density of the untreated metal is greatest in the mild steel specimens and diminishes as the per cent. of carbon and other elements increase.

The specific gravity of the metal from tensile specimens adjacent to the place of rupture is less than the specific gravity of the bar. At the distance of 7″ from the place of rupture the change in density is slight or inappreciable in some bars.

The metal seems capable of slight condensation beyond its finished condition from the hot-rolled bars, as shown by the effects of compression loads which exceed the elastic limit.

The maximum effect is soon reached, and higher loads accompanied by greater flow of the metal cause only slight additional changes; the tendency in some cases being to produce the reverse effect and diminish the density.

Samples taken from tensile specimens and then subjected to compression stresses showed, as the effects of the latter treatment, which changed the direction of flow, a diminution in density.

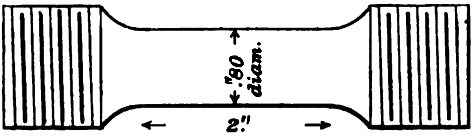
Although the original specific gravities of the tensile specimens are not known, it is worthy of remark that their specific gravities averaged higher after having been strained than the specimens from the unstrained bars.

None of the changes in density are of great magnitude except for the specimens adjacent to the places of rupture of tensile bars; there is a confirmation of the results, however, afforded by the number of specimens acting in the same direction.

The indications are that stresses which cause flow also cause concomitant changes in density, and whether the change will be toward greater or less density depends upon the treatment and the previous condition of the metal.

TENSILE STRESSES APPLIED TO SHORT PIECES BEFORE SPECIFIC GRAVITY SPECIMENS WERE TAKEN OUT.

Form of specimens.



Sectional area, .503 square inch.

TABLE No. 1.

Marks.	Applied loads.		Elongation in 2 inches.	Minimum diameter.
	Total.	Per square inch.		
	Pounds.	*Pounds.*	*Inch.*	*Inch.*
1-833 5th	18,108	36,000	.04	.7885
1-833 6th	21,126	42,000	.08	.782
1-833 7th	24,144	48,000	.135	.772
2-123 5th	25,150	50,000	.05	.7896
2-123 6th	29,174	58,000	.075	.7834
2-123 7th	33,198	66,000	.14	.770
4-795 5th	30,180	60,000	.035	.7913
4-795 6th	35,210	70,000	.065	.7853
4-795 7th	40,240	80,000	.11	.7755
6-797 5th	35,210	70,000	.015	.7968
6-797 6th	45,270	90,000	.03	.7918
6-797 7th	55,330	110,000	.075	.7835

TABLE No. 2.

SPECIFIC GRAVITY DETERMINATIONS OF STEEL BARS.

[Chemical composition, C, .09; Mn, .11.]

Marks.	Dimensions.		Sectional area.	Compression loads.		Weight in—		Difference.	Temperature of water (degrees Fahr.).	Specific gravity.	Remarks.
	Length.	Diameter.		Total.	Per square inch.	Air.	Water.				
	Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Grammes.*	*Grammes.*	*Grammes.*			
1-833 1st	1.0000	.8005	....	....	....	64.7778	56.5583	8.2195	73	7.8717	Mean specific gravity, 7.8705.
1-833 2d	.9985	.8000	....	....	....	64.5967	56.3998	8.1969	74	7.8707	
1-833 3d	.9997	.7998	....	....	....	64,6350	56.4322	8.2028	74	7.8694	
1-833 4th	1.0014	.8002	....	....	....	64.7593	56.5417	8.2176	74	7.8704	
						[First compression.]					
1-833 1st	.9808	.8095	.514	18,000	35,020	64.7778	56.5532	8.2256	65.5	7.8717	
1-833 2d	.968	.814	.520	21,000	40,380	64.5967	56.3967	8.2000	67.75	7.8726	
						[Second compression.]					
1-833 1st	.9750	.812	.518	21,000	40,540	64.7775	56.5584	8.2191	71.25	7.8774	
1-833 2d	.963	.8165	.524	24,000	45,800	64.5963	56.3992	8.1971	71.25	7.8727	
						[Third compression.]					
1-833 1st	.948	.824	.533	30,000	56,290	64.7777	56.5595	8.2182	71	7.8747	
1-833 2d	.923	.837	.550	35,000	63,640	64.5964	56.4000	8.1961	72.5	7.8725	
				[After application of tensile stresses as per table No. 1.]							
1-833 5th	1.0115	.7885	....	....	....	63.7400	55.6500	8.0900	67	7.8744	
1-833 6th	1.0060	.782	....	....	....	62.1762	54.2843	7.8919	68.	7.8783	
1-833 7th	1.0076	.772	....	....	....	60.6369	52.9434	7.6935	68.5	7.8760	
				[Compression loads applied to cylinders previously strained by tension.]							
1-833 5th	1.0085	.7930	.494	18,108	36,660	63.7402	55.6578	8.0824	78.75	7.8715	
1-833 6th	1.0020	.7844	.483	18,108	37,490	62.1760	54.2789	7.8971	64.50	7.8705	
1-833 7th	1.0054	.7736	.470	18,108	38,530	60.6368	52.9363	7.7005	64.50	7.8716	
					[Specimens taken from tension bar No. 753.]						
1-833	....	....	....	....	....	64.8496	56.6258	8.2248	79	7.8700	Taken 7" from fracture.
1-833	....	....	....	....	....	41.0452	35.8282	5.2170	78	7.8536	Taken at fracture.
								Difference		.164	=.21 per cent.

TABLE No. 3.

SPECIFIC GRAVITY DETERMINATIONS OF STEEL BARS.

[Chemical composition, C, .21; Mn, .45.]

Marks.	Dimensions.		Sectional area.	Compression loads.		Weight in—		Difference.	Temperature of water (degrees Fahr.).	Specific gravity.	Remarks.
	Length.	Diameter.		Total.	Per square inch.	Air.	Water.				
	Inches.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Grammes.*	*Grammes.*	*Grammes.*			
2-123 1st	.9950	.8004	....	....	....	64.2921	56.1218	8.1703	70½	7.8619	Mean specific gravity, 7.8609.
2-123 2nd	.9960	.8006	....	....	....	64.5399	56.3376	8.2023	71½	7.8606	
2-123 3d	.9981	.8003	....	....	....	64.5287	56.3234	8.2008	72	7.8601	
2-123 4th	.9895	.8004	....	....	....	63.9329	55.8087	8.1242	72	7.8611	
[First compression.]											
2-123 1st	.974	.810	.515	25,150	48,830	64.2921	56.1221	8.1700	68.5	7.8638	
2-123 2nd	.966	.815	.522	29,174	55,890	64.5399	56.3409	8.1990	72	7.8634	
[Second compression.]											
2-123 1st	.967	.8135	.520	29,000	55,770	64.2916	56.1245	8.1671	71.25	7.8643	
2-123 2nd	.960	.8175	.525	33,000	62,860	64.5397	56.3387	8.2010	70.75	7.8624	
[Third compression.]											
2-123 1st	.953	.818	.526	35,000	66,540	64.2917	56.1187	8.1730	66	7.8625	
2-123 2d	.940	.826	.536	40,000	74,630	64.5397	56.3367	8.2030	67.25	7.8632	
[After application of tensile stresses as per table No. 1.]											
2-123 5th	1.0015	.7896	....	....	....	63.0764	55.0590	8.0174	67	7.8630	
2-123 6th	1.0100	.7834	....	....	....	62.6106	54.6528	7.9578	68	7.8627	
2-133 7th	1.0000	.770	....	....	....	59.8936	52.2818	7.6118	68.75	7.8628	
[Compression loads applied to cylinders previously strained by tension.]											
2-123 5th	.9872	.7972	.499	25,150	50,400	63.0764	55.0573	8.0191	65.5	7.8623	
2-123 6th	.9962	.7892	.489	25,150	51,430	62.6105	54.6504	7.9601	65.75	7.8620	
2-123 7th	.9914	.7744	.471	25,150	53,400	59.8938	52.2790	7.6148	66	7.8617	
[Specimens taken from tension bar No. 754.]											
2-123	....	....	....	....	....	64.6226	56.4175	8.2051	79	7.8609	Taken 7" from fracture.
2-123	....	....	....	....	....	49.8337	43.4928	6.3409	77	7.8460	Taken at fracture.
								Difference		.0149	= .19 per cent.

TABLE NO. 4.

SPECIFIC GRAVITY DETERMINATIONS OF STEEL BARS.

[Chemical composition, C, .37; Mn, .79.]

Marks.	Dimensions.		Sectional area.	Compression loads.		Weight in—		Difference.	Temperature of water (degrees Fahr.).	Specific gravity.	Remarks.
	Length.	Diameter.		Total.	Per square inch.	Air.	Water.				
	Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Grammes.*	*Grammes.*	*Grammes.*			
4-795 1st	1.0000	.8006	....	....	....	64.5236	56.3059	8.2177	72.5	7.8430	Mean specific gravity, 7.8433.
4-795 2d	1.0004	.8005	....	....	....	64.4901	56.2776	8.2125	72.5	7.8439	
4-795 3d	1.0020	.8006	....	....	....	64.6752	56.4392	8.2360	73	7.8435	
4-795 4th	1.0002	.8003	....	....	....	64.4131	56.2100	8.2031	73.5	7.8426	
[First compression.]											
4-795 1st	.982	.8086	.514	30,180	58,720	64.5240	56.3082	8.2158	71	7.8462	
4-795 2d	.974	.812	.518	35,210	67,970	64.4901	56.2772	8.2129	70.5	7.8452	
[Second compression.]											
4-795 1st	.976	.8115	.517	35,000	67,700	64.5241	56.3040	8.2201	65.75	7.8459	
4-795 2d	.964	.816	.523	40,000	76,480	64.4901	56.2754	8.2147	67.5	7.8458	
[Third compression.]											
4-795 1st	.956	.820	.528	45,000	85,230	64.5241	56.3072	8.2169	71.5	7.8448	
4-795 2d	.910	.840	.554	55,000	99,280	64.4901	56.2785	8.2116	72.5	7.8447	
[After application of tensile stresses as per table No. 1.]											
4-795 5th	1.0045	.7913	....	....	....	63.3698	55.2960	8.0738	64.5	7.8461	
4-795 6th	1.0105	.7853	....	....	....	62.7683	54.7693	7.9990	63.25	7.8451	
4-795 7th	1.0081	.7755	....	....	....	61.0902	53.3051	7.7851	65.5	7.8436	
[Compression loads applied to cylinders previously strained by tension.]											
4-795 5th	.9874	.7996	.502	30,180	60,120	63.3698	55.2949	8.0749	64.75	7.8448	
4-795 6th	.9960	.7926	.493	30,180	61,220	62.7682	54.7694	7.9988	66.25	7.8433	
4-795 7th	.9963	.7814	.480	30,180	62,870	61.0902	53.3066	7.7836	67.5	7.8438	
[Specimens taken from tension bar No. 756.]											
4-795	.816	.602 .712	End diameters			36.9548	32.2298	4.7250	65	7.8180	Taken at fracture.
4-795	.796	.741 .742				44.0660	38.4427	5.6233	58.5	7.8371	Taken 7″ from fracture.
								Difference		.0191	=.24 per cent.

TABLE NO. 5.

SPECIFIC GRAVITY DETERMINATIONS OF STEEL BARS.

[Chemical composition, C, .57; Mn, .93; S, .07.]

Marks.	Dimensions.		Sectional area.	Compression loads.		Weight in—		Difference.	Temperature of water (degrees Fahr.).	Specific gravity.	Remarks.
	Length.	Diameter.		Total.	Per square inch.	Air.	Water.				
	Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Grammes.*	*Grammes.*	*Grammes.*			
6-797 1st	.9996	.8004	....	....	....	64.4836	56.2695	8.2141	74	7.8402	Mean specific gravity, 7.8398.
6-797 2d	1.0002	.8006	....	....	....	64.5111	56.2925	8.2186	74	7.8392	
6-797 3d	1.0066	.7996	....	....	....	64.4035	56.1999	8.2036	74	7.8405	
6-797 4th	1.0013	.8008	....	....	....	64.4970	56.2805	8.2165	74.5	7.8391	
[First compression.]											
6-797 1st	.9923	.804	.508	35,210	69,310	64.4837	56.2682	8.2155	69.25	7.8430	
6-797 2d	.9823	.8065	.514	45,270	88,070	64.5114	56.2904	8.2210	68	7.8420	
[Second compression.]											
6-797 1st	.988	.808	.513	45,000	87,720	64.4837	56.2707	8.2130	73.25	7.8420	
6-797 2d	.972	.8138	.520	55,000	105,770	64,5113	56.2957	8.2156	74.75	7.8414	
[Third compression.]											
6-797 1st	.955	.821	.529	65,000	122,870	64.4828	56.2633	8.2195	62.5	7.8435	
6-797 2d	.923	.842	.557	75,000	134,650	64.5108	56.2843	8.2265	64	7.8394	
[After application of tensile stresses as per table No. 1.]											
6-797 5th	1.0120	.7968	....	....	....	64.7215	56.4751	8.2464	70	7.8418	
6-797 6th	1.0176	.7918	....	....	....	64.2629	56.0750	8.1879	70.25	7.8417	
6-797 7th	1.0119	.7835	....	....	....	62.5436	54.5738	7.9698	70.5	7.8405	
[Compression loads applied to cylinders previously strained by tension.]											
6-797 5th	1.0000	.8030	.506	35,210	69,580	64.7213	56.4741	8.2472	68.5	7.8421	
6-797 6th	1.0010	.7995	.502	35,210	70,140	64.2629	56.0733	8.1896	68.5	7.8414	
6-797 7th	.9947	.7912	.492	35,210	71,560	62.5434	54.5728	7.9706	69.25	7.8407	
[Specimens taken from tension bar No. 758.]											
6-797	.8033	.762	....	....	....	46.8105	40.8416	5.9689	69.5	7.8361	Taken 7" from fracture.
6-797	.7994	.748 .751	End diameters....		....	45.0117	39.2707	5.7410	68.75	7.8347	Taken at fracture.
								Difference......		.0014	=.02 per cent.

TABLE No. 6.

SPECIFIC GRAVITY DETERMINATIONS OF STEEL BARS.

[Chemical composition, C, .81; Mn, .56; S, .17.]

Marks.	Dimensions.		Sectional area.	Compression loads.		Weight in—		Difference.	Temperature of water (degrees Fahr.).	Specific gravity.	Remarks.
	Length.	Diameter.		Total.	Per square inch.	Air.	Water.				
	Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Grammes.*	*Grammes.*	*Grammes.*			
8-750 1st	.9999	.7997	....	....	....	64.2534	56.0524	8.2010	73	7.8256	Mean specific gravity, 7.8248.
8-750 2d	1.0000	.8000	....	....	....	64.3141	56.1028	8.2113	70	7.8257	
8-750 3d	1.0016	.8000	....	....	....	64.3353	56.1200	8.2153	71	7.8237	
8-750 4th	1.0010	.8004	....	....	....	64.3579	56.1402	8.2177	71	7.8242	
[First compression.]											
8-750 1st	.995	.802	.505	45,000	89,110	64.2536	56.0567	8.1969	77	7.8257	
8-750 2d	.9892	.805	.509	55,000	108,050	64.3141	56.1097	8.2044	78	7.8249	
[Second compression.]											
8-750 1st	.982	.807	.511	65,000	127,200	64.2534	56.0495	8.2039	73.25	7.8226	
8-750 2d	.978	.812	.518	75,000	144,790	64.3140	56.1055	8.2085	73.75	7.8251	
[Specimen taken from tension bar No. 760.]											
8-750	.798	.776 .778	End diameters			48.4165	42.2378	6.1787	75	7.8249	Taken at fracture.

TABLE No. 7.

SPECIFIC GRAVITY DETERMINATIONS OF STEEL BARS AFTER RUPTURE BY TENSION.

Tension test number.	Marks.	Chemical composition.			Dimensions.		Weight in—		Difference.	Temperature of water (degrees Fahr.).	Specific gravity.	Location in tension bar.
		Carbon.	Manganese.	Silicon.	Length.	Diameter.	Air.	Water.				
		Per cent.	*Per cent.*	*Per cent.*	*Inch.*	*Inch.*	*Grammes.*	*Grammes.*	*Grammes.*			
755	3–782	.31	.57	....	.786	.746	44.5227	38.8525	5.6702	64.75	7.8491	7" from fracture.
					.8136	.623 .698	37.1255	32.3860	4.7395	65.75	7.8296	At fracture.
										Difference ..	.0195	=.25 per cent.
757	5–803	.51	.58	.02	.8108	.743 .748	45.2472	39.4685	5.7787	64.25	7.8274	7" from fracture.
					.7936	.638 .727	38.3133	33.4091	4.9042	63	7.8106	At fracture.
										Difference ..	.0168	=.20 per cent.
759	7–823	.71	.58	.08	.800	.718 .663	38.2955	33.4103	4.8852	74.25	7.8285	At fracture.
761	9–756	.89	.57	.19	.801	.740 .741	44.0408	38.4182	5.6221	73.5	7.8281	At fracture.

RIVETED JOINTS.

TESTS MADE FOR THE BUREAU OF STEAM ENGINEERING, U. S. NAVY DEPARTMENT.

The specimens were prepared at the Brooklyn navy-yard.

The joints were made of open-hearth steel plates, which had drilled rivet-holes and sheared edges. Both steel and wrought-iron rivets were employed, as noted in the details. They were machine driven.

The strips tested to show the quality of the metal employed in the joints were furnished by the steel-makers as being the same grade of metal, although not from the same sheets as the joints.

The tests were conducted in the same manner as earlier tests of this class recorded in previous reports.

The gauged length was established symmetrically with the center line of the joint, and observations were made on this section at intervals during the progress of the test.

It will be seen that the thickness of the plates varied considerably at different edges; these measurements are in their respective places on the sketches which accompany the details.

After testing from a number of the joints, the rivet-heads were planed off, the rivets driven out, and butt-straps removed, thus giving access to the rivet-holes in the plate, which were then measured and their elongation recorded on the sketch.

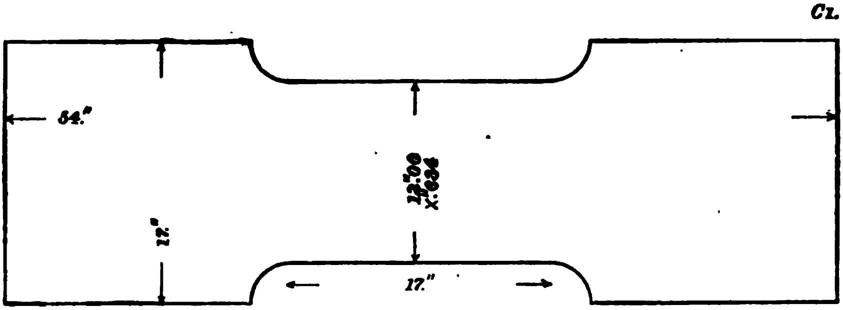
From these figures the transmission of stresses to the different rows of rivet-holes may be approximately judged of.

The metal drew down in thickness in zigzag lines from rivet-hole to rivet-hole of adjacent rows, notwithstanding the extent of metal thus traversed was greater than directly across the plate through one line of rivet-holes.

The average tensile strength of the three specimens of each thickness of plate was used in computing the efficiencies of the joints.

TESTS OF THE METAL.—DETAILS.

No. 904.



Sectional area, 7.608 square inches.
Gauged length, 15″.
Plate warped.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
7,608	1,000	0.	0.	Initial load.
38,040	5,000	.0024	0.	
76,080	10,000	.0034	.0001	
114,120	15,000	.0083	.0002	
152,160	20,000	.0114	.0007	
159,768	21,000	.0122	....	
167,376	22,000	.0130	....	
174,984	23,000	.0140	....	
182,592	24,000	.0148	....	
190,200	25,000	.0160	.0027	
192,000	....	.0165	....	
194,000	....	.0170	....	
196,000	....	.0173	....	
198,000	....	.0177	....	
200,000	....	.0183	....	
202,000	....	.0185	....	
204,000	....	.0188	....	
206,000	....	.0191	....	
208,000	....	.0195	....	
210,000	....	.0199	....	
212,000	....	.0205	....	
214,000	....	.0210	....	
216,000	....	.0218	....	
218,000	28,650	.0225	....	Elastic limit.
220,000	....	.0238	....	
222,000	....	.0285	....	
224,000	....	.0540	....	
226,000	....	.1450	....	
228,240	30,000	.20	....	
235,848	31,000	.23	....	
243,456	32,000	.26	....	
251,064	33,000	.28	....	
258,672	34,000	.29	....	
266,280	35,000	.31	....	
273,888	36,000	.35	....	
281,496	37,000	.39	....	
289,104	38,000	.42	....	
296,712	39,000	.46	....	
304,320	40,000	.50	....	
311,928	41,000	.55	....	
319,536	42,000	.60	....	
327,144	43,000	.65	....	
334,752	44,000	.72	....	
342,360	45,000	.81	....	
349,968	46,000	.86	....	

No. 904—Continued.

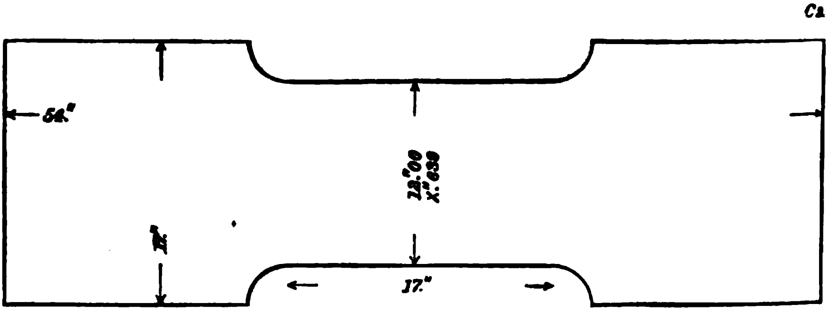
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
357, 576	47, 000	.95	....	
365, 184	48, 000	1.04	....	
372, 792	49, 000	1.16	....	
380, 400	50, 000	1.27	....	
388, 008	51, 000	1.47	....	
395, 616	52, 000	1.67	....	
403, 224	53, 000	2.17	....	
410, 832	54, 000	2.85	....	
411, 700	54, 120	3.20	....	Tensile strength.
....	....	....	5.28	= 34.9 per cent.

Elongation of inch sections: ″.15, ″.17, ″.20, ″.21, ″.25, ″.26, ″.34, ″.42, ″.58, 1″.20*, ″.39, ″.33, ″.30, ″.22, ″.21.

Area at fracture, ″9.76 × ″.45 = 4.392 square inches. Contraction, 42.2 per cent.

Appearance of fracture, silky, slightly lamellar. Fracture open at middle, ″.50; at edges, ″.10 and 0.

No. 905.



Sectional area, 7.668 square inches.
Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
7, 668	1, 000	0.	0.	Initial load.
38, 340	5, 000	.0017	0.	
76, 680	10, 000	.0042	0.	
115, 020	15, 000	.0065	0.	
153, 360	20, 000	.0089	0.	
161, 028	21, 000	.0094	....	
168, 696	22, 000	.0098	....	
176, 364	23, 000	.0103	....	
184, 032	24, 000	.0108	....	
191, 700	25, 000	.0112	—.0001	
194, 000	....	.0113	....	
196, 000	....	.0115	....	

No. 905—Continued.

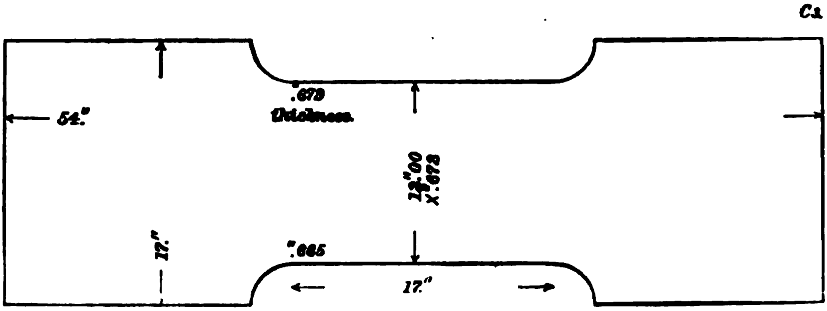
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
198,000	....	.0116	....	
200,000	....	.0118	....	
202,000	....	.0120	....	
204,000	....	.0123	....	
206,000	....	.0125	....	
208,000	....	.0127	....	
210,000	....	.0130	....	
212,000	....	.0133	....	
214,000	....	.0136	....	
216,000	....	.0140	....	
218,000	....	.0144	....	
220,000	....	.0150	....	
222,000	28,950	.0154	....	**Elastic limit.**
224,000	....	.0162	....	
226,000	....	.0170	....	
228,000	....	.0183	....	
230,040	....	.0218	....	
232,000	....	.0277	....	
234,000	....	.0480	....	
236,000	....	.0995	....	
237,708	31,000	.2175	....	
245,376	32,000	.23	....	
253,044	33,000	.25	....	
260,712	34,000	.28	....	
268,380	35,000	.31	....	
276,048	36,000	.33	....	
283,716	37,000	.37	....	
291,384	38,000	.41	....	
299,053	39,000	.45	....	
306,720	40,000	.50	....	
314,388	41,000	.54	....	
322,056	42,000	.59	....	
329,724	43,000	.66	....	
337,392	44,000	.71	....	
345,060	45,000	.78	....	
352,728	46,000	.86	....	
360,396	47,000	.95	....	
368,064	48,000	1.07	....	
375,732	49,000	1.21	....	
383,400	50,000	1.47	....	
391,068	51,000	1.58	....	
398,736	52,000	1.80	....	
406,404	53,000	2.08	....	
414,072	54,000	2.98	....	
414,800	54,100	3.42	....	**Tensile strength.**
0	0	0	5.52	**=36.8 per cent.**

Elongation of inch sections: ″.23, ″.20, ″.24, ″.26, ″.34, ″.35, ″.40, 1″.03*, ″.69, ″.48, ″.35, ″.31, ″.26, ″.21, ″.17.

Area at fracture, 9″.62×″.48=4.618 square inches. Contraction, 39.8 per cent.

Appearance of fracture, silky, slightly lamellar. Fracture open at middle, ′.38; at edges, ″.10 and 0.

No. 906.



Sectional area, 8.064 square inches.
Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
8,064	1,000	0.	0.	Initial load.
40,320	5,000	.0018	0.	
80,640	10,000	.0042	0.	
120,960	15,000	.0068	.0002	
161,280	20,000	.0100	.0010	
169,344	21,000	.0108	....	
177,408	22,000	.0115	....	
185,472	23,000	.0123	....	
193,536	24,000	.0133	....	
196,000	....	.0137	....	
198,000	....	.0141	....	
200,000	....	.0144	....	
201,600	25,000	.0148	.0029	
204,000	....	.0152	....	
206,000	....	.0155	....	
208,000	25,790	.0158	....	Elastic limit.
210,000	....	.0168	....	
212,000	....	.0176	....	
214,000	....	.0188	....	
216,000	....	.0218	....	
218,000	....	.0570	....	
220,000	....	.0740	....	
222,000	....	.0987	....	
225,792	28,000	.1800	....	
233,856	29,000	.21	....	
241,920	30,000	.23	....	
249,984	31,000	.25	....	
258,048	32,000	.27	....	
266,112	33,000	.29	....	
274,176	34,000	.33	....	
282,240	35,000	.36	....	
290,304	36,000	.38	....	
298,368	37,000	.42	....	
206,432	38,000	.46	....	
314,496	39,000	.51	....	
322,560	40,600	.55	....	
330,624	41,000	.60	....	
338,688	42,000	.65	....	
346,752	43,000	.71	....	
354,816	44,000	.78	....	
362,880	45,000	.86	....	
370,944	46,000	.94	....	
379,008	47,000	1.07	....	
387,072	48,000	1.18	....	
395,136	49,000	1.30	....	
403,200	50,000	1.48	....	
411,264	51,000	1.71	....	
419,328	52,000	2.18	....	
426,600	52,900	2.98	....	Tensile strength.

No. 906—Continued.

Applied loads.		In gauged length.		Remarks.
Total	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
426,500	....	3.18	....	
426,200	....	3.32	....	
426,000	....	3.42	....	
425,000	....	3.62	....	
424,000	....	3.75	....	
423,000	....	4.00	....	10".50×".585 Minimum width and thickness.
422,000	....	4.05	....	10".45×".580
420,000	....	4.40	....	10".23×".567
415,000	....	4.63	....	10".08×".555
410,000	....	4.82	....	9".97×".534
395,000	....	....	....	Opened fracture at middle of plate.
280,000	....	....	....	Crack opened about 4" long by ".10 wide at middle. Specimen now struck several blows in vicinity of fracture with 15-pound sledge, without apparent injury. Rupture now completed by continuing the stretch of the plate.
0	0	....	5.28	= 35.2 per cent.

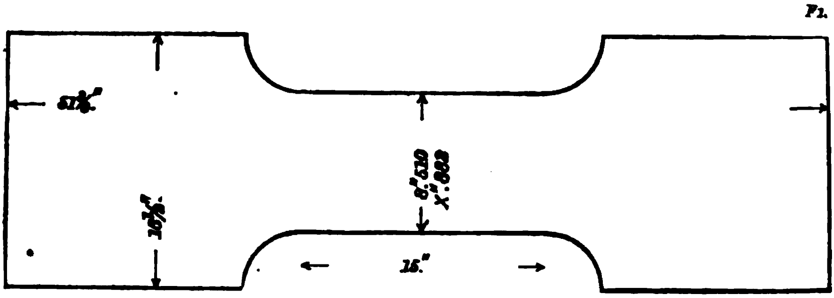
Elongation of inch sections: ".17, ".21, ".28, ".37, ".50, 1".23*, ".51, ".41, ".34, ".27, ".26, ".22, ".16, ".17, ".18.

Area at fracture, 9".65×".49=4.728 square inches. Contraction, 41.3 per cent.

Appearance of fracture, silky, lamellar. Fracture open at middle, ".45; at edges, ".10 and 0.

The maximum contraction in thickness after passing the highest load and before rupture occurred, took place along an oblique line, making an angle of 53° with the axis of the specimen. Rupture occurred in a line nearly at right angles to the axis of the specimen, intersecting the line of least thickness of metal at about the middle of the plate.

No. 907.



Sectional area, 7.5 square inches.
Gauged length, 15".

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
7,500	1,000	0.	0.	Initial load.
37,500	5,000	.0019	0.	
75,000	10,000	.0043	0.	
112,500	15,000	.0065	0.	
150,000	20,000	.0090	.0001	
157,500	21,000	.0095	....	
165,000	22,000	.0101	....	
172,500	23,000	.0106	....	
180,000	24,000	.0115	....	Elastic limit.
187,500	25,000	.0129	.0017	
190,000	....	.0139	....	
192,000	....	.0149	....	
195,000	26,000	.0164	....	
197,000	....	.0186	....	
199,000	....	.0241	....	
202,500	27,000	.1540	....	
210,000	28,000	.17	....	
217,500	29,000	.19	....	
225,000	30,000	.22	....	
232,500	31,000	.24	....	
240,000	32,000	.26	....	
247,500	33,000	.28	....	
255,000	34,000	.32	....	
262,500	35,000	.36	....	
270,000	36,000	.40	....	
277,500	37,000	.45	....	
285,000	38,000	.49	....	
292,500	39,000	.54	....	
300,000	40,000	.59	....	
307,500	41,000	.66	....	
315,000	42,000	.71	....	
322,500	43,000	.79	....	
330,000	44,000	.86	....	
337,500	45,000	.95	....	
345,000	46,000	1.06	....	
352,500	47,000	1.19	....	
360,000	48,000	1.33	....	
367,500	49,000	1.59	....	
375,000	50,000	1.94	....	
382,500	51,000	2.34	....	
386,400	51,520	3.25	....	Tensile strength.
0	0	....	5.08	=33.9 per cent.

Elongation of inch sections: ".17, ".17, ".25, ".29, ".34, ".46, "1.31*, ".49, ".34, ".30, "24, ".24, ".20, ".17, ".11.

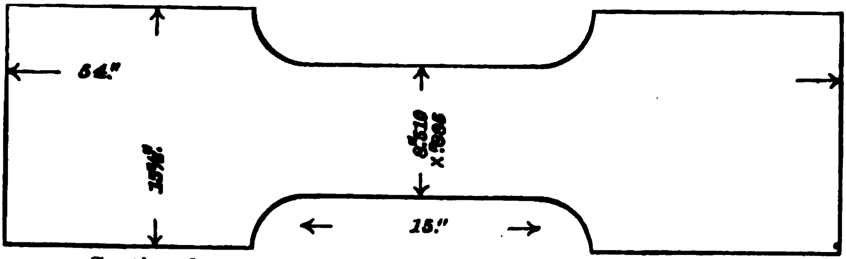
Area at fracture, 6.53×".63=4.11 square inches. Contraction, 45.2 per cent.

Appearance of fracture silky, slight lamination.

Fracture opened at middle of width of plate, and extended to the edges.

After fracture, placing the ends together in line, there was an opening at the middle of ".44, at one edge ".10, the other end being closed.

No. 908. *Fe.*



Sectional area, 7.53 square inches. Gauged length, 15".

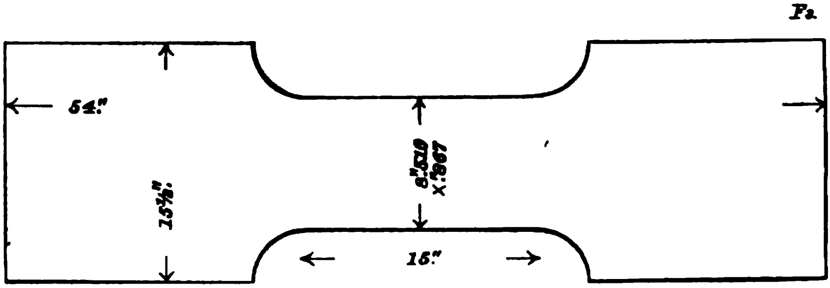
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
7,530	1,000	0.	0.	Initial load
37,650	5,000	.0018	0.	
75,300	10,000	.0041	0.	
112,950	15,000	.0066	0.	
150,600	20,000	.0090	.0001	
158,130	21,000	.0096	....	
165,660	22,000	.0101	....	
173,190	23,000	.0108	....	
176,000	....	.0110	....	
178,000	....	.0112	....	
180,000	....	.0114	....	
182,000	....	.0116	....	
184,000	....	.0122	....	
186,000	....	.0125	....	
188,000	....	.0127	....	
190,000	....	.0129	....	
192,000	....	.0132	....	
194,000	....	.0134	....	
196,000	....	.0138	....	
198,000	26,300	.0142	....	Elastic limit.
200,000	....	.0150	....	
202,000	....	.0156	....	
204,000	....	.0164	....	
206,000	....	.0191	....	
208,000	....	.0920	....	
210,840	28,000	.1490	....	
218,370	29,000	.17	....	
225,900	30,000	.20	....	
233,430	31,000	.23	....	
240,960	32,000	.26	....	
248,490	33,000	.28	....	
256,020	34,000	.31	....	
263,550	35,000	.34	....	
271,080	36,000	.38	....	
278,610	37,000	.42	....	
286,140	38,000	.45	....	
293,670	39,000	.50	....	
301,200	40,000	.55	....	
308,730	41,000	.60	....	
316,260	42,000	.66	....	
323,790	43,000	.72	....	
331,320	44,000	.78	....	
338,850	45,000	.86	....	
346,380	46,000	.96	....	
353,910	47,000	1.10	....	
361,440	48,000	1.23	....	
368,970	49,000	1.38	....	
376,500	50,000	1.62	....	
384,030	51,000	1.92	....	
391,560	52,000	2.38	....	
395,100	52,470	2.91	....	Tensile strength.
395,000	....	3.25	....	
392,000	....	3.65	....	
0	0	....	4.98	=33.2 per cent.

Elongation of inch sections: ".18, ".16, ".22, ".27, ".35, ".50, 1".21*, ".50, ".33, ".30, ".25, ".23, ".20, ".17, ".11.

Area at fracture, 6".59 × ".62=4.09 square inches. Contraction, 45.7 per cent. Appearance of fracture, silky, slightly lamellar.

Fracture began at middle of width of plate. Opening after fracture, ".32; edges closed.

No. 909.



Sectional area, 7.378 square inches.
Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
7, 378	1, 000	0.	0.	Initial load.
36, 890	5, 000	.0020	0.	
73, 780	10, 000	.0045	0.	
110, 670	15, 000	.0070	0.	
147, 560	20, 000	.0097	0.	
154, 930	21, 000	.0103	....	
162, 316	22, 000	.0108	....	
169, 694	23, 000	.0115	....	
172, 000	....	.0120	....	
174, 000	....	.0122	....	
176, 000	....	.0124	....	
178, 000	....	.0127	....	
180, 000	....	.0130	....	
182, 000	....	.0134	....	
184, 000	....	.0137	....	
186, 000	....	.0142	....	
188, 000	....	.0147	....	
190, 000	25, 750	.0153	....	Elastic limit.
192, 000	....	.0165	....	
194, 000	....	.0182	....	
196, 000	....	.1775	....	
206, 584	28, 000	.23	....	
213, 962	29, 000	.26	....	
221, 340	30, 000	.28	....	
228, 718	31, 000	.32	....	
236, 096	32, 000	.35	....	
243, 474	33, 000	.38	....	
250, 852	34, 000	.43	....	
258, 230	35, 000	.47	....	
265, 608	36, 000	.52	....	
272, 986	37, 000	.57	....	
280, 364	38, 000	.63	....	
287, 742	39, 000	.69	....	
295, 120	40, 000	.74	....	
302, 498	41, 000	.84	....	
309, 876	42, 000	.92	....	
317, 254	43, 000	1.01	....	
324, 632	44, 000	1.16	....	
332, 010	45, 000	1.28	....	
339, 388	46, 000	1.47	....	
346, 766	47, 000	1.67	....	
354, 146	48, 000	1.98	....	
361, 524	49, 000	2.48	....	
365, 700	49, 570	3.30	....	Tensile strength.
0	0	....	5.31	=35.4 per cent.

Elongation of inch sections: ″.17, ″.20, ″.22, ″25, ″.29, ″.36, ″.49, 1.″41*, ″.51, ″.37, ″.29, ″.25, ″.21, ″.17, ″.12.

Area at fracture, 6.″43 × ″.58 = 3.73 square inches. Contraction, 49.4 per cent.

Appearance of fracture, silky, lamellar.

Fracture open at the middle, ″.40; edges closed.

TABULATION OF RIVETED JOINT METAL FOR U. S. NAVY DEPARTMENT, BUREAU OF STEAM ENGINEERING.

Test No.	Mark on specimen.	Dimensions.		Sectional area.	Elastic limit.		Ultimate strength.		Elongation in 15 inches.		Area at fracture.	Contraction of area.	Appearance of fracture.	Elongation of 1-inch sections.
		Width.	Thickness.		Total.	Per square inch.	Total.	Per square inch.						
		Inches.	*Inch.*	*Sq. in.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Inches.*	*Pr. ct.*	*Inches. Sq. in.*	*Per. ct.*		
904	C₁	12.00	.634	7.608	218,000	28,650	411,700	54,120	5.23	34.9	9.76×.45=4.392	42.2	Silky, slightly lamellar.	″.15, ″.17, ″.20, ″.21, ″.25, ″.26, ″.34, ″.42, ″.58, 1″.20*, ″.39, ″.33, ″.30, ″.22, ″.21.
905	C₂	12.00	.639	7.668	222,000	28,950	414,800	54,100	5.52	36.8	9.62×.48=4.618	39.8	......do	.23, .20, .24, .26, .34, .35, .40, 1.03*, .69, .48, .35, .31, .26, .21, .17.
906	C₃	12.00	.672	8.064	208,000	25,790	426,600	52,900	5.28	35.2	9.65×.49=4.728	41.3	Silky, lamellar...... ...	.17, .21, .28, .37, .50, 1.23*, .51. .41, .34, .27, .26, .22, .16, .17, .18.
907	F₁	8.510	.882	7.500	180,000	24,000	386,400	51,520	5.08	33.9	6.53×.63=4.11	45.2	Silky, slight lamination.	.17, .17, .25, .29, .34, .46, 1.31*, .49, .34, .30, .24, .24, .20, .17, .11.
908	F₂	8.510	.885	7.53	198,000	26,300	395,100	52,470	4.98	33.2	6.59×.62=4.09	45.7	Silky, slightly lamellar.	.18, .16, .22, .27, .35, .50, 1.21*, .50, .33, .30, .25, .23, .20, .17, .11.
909	F₃	8.510	.867	7.378	190,000	25,750	365,700	49,570	5.31	35.4	6.43×.58=3.73	49.4	Silky, lamellar..........	.17, .20, .22, .25, .29, .36, .49, 1.41*, .51, .37, .29, .25, .21, .17, .12.

DETAILS OF RIVETED JOINTS FOR U. S. NAVY DEPARTMENT, BUREAU OF STEAM ENGINEERING.

No. 910.

($\frac{3}{4}$″ steel rivets; $\frac{25}{32}$″ drilled holes.)

Areas.

Plate B, gross sectional area....................square inches.. 13.22
Plate B, net sectional area....................do...... 10.12
Plate B, bearing surface of rivets....................do...... 6.72
Rivets, shearing area....................do...... 12.46

Gauged length, 15″.

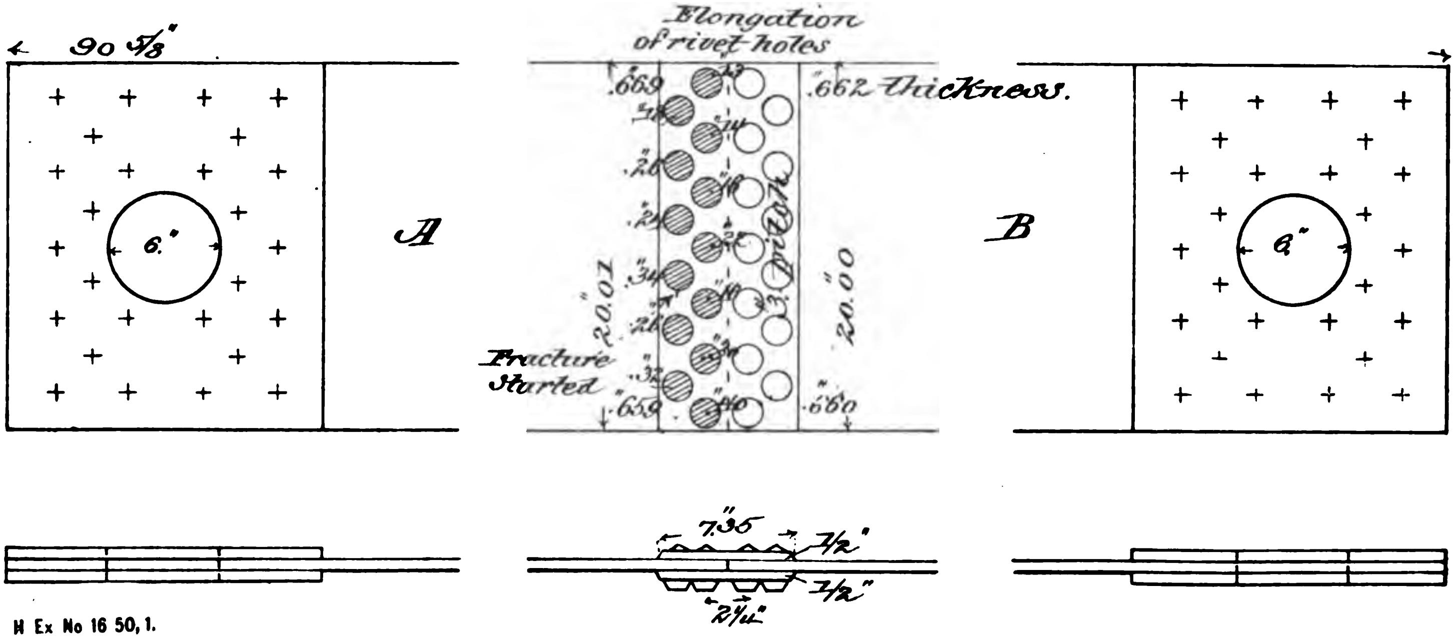
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
13,220	1,000	0.	0.	Initial load.
26,440	2,000	.0001	....	
39,660	3,000	.0003	....	
52,880	4,000	.0008	....	
66,100	5,000	.0014	.0007	
79,320	6,000	.0025	....	
92,540	7,000	.0032	....	
105,760	8,000	.0039	....	
118,980	9,000	.0052	....	
132,200	10,000	.0068	.0043	
145,420	11,000	.0097	....	
158,640	12,000	.0119	....	
171,860	13,000	.0138	....	
185,080	14,000	.0159	....	
198,300	15,000	.0185	.0127	
211,520	16,000	.0206	....	
224,740	17,000	.0232	....	
237,960	18,000	.0264	....	
251,180	19,000	.0298	....	
264,400	20,000	.0329	.0222	
277,620	21,000	.0370	....	
290,840	22,000	.0431	....	
304,060	23,000	.0506	....	
317,280	24,000	.0596	....	
330,500	25,000	.0779	.0606	
343,720	26,000	.1086	....	
356,940	27,000	.1197	....	
370,160	28,000	.1434	....	
383,380	29,000	.18	....	
396,600	30,000	.24	....	
409,820	31,000	.28	....	
423,040	32,000	.31	....	
436,260	33,000	.39	....	
449,480	34,000	.45	....	
462,700	35,000	.49	....	
475,920	36,000	.56	....	
489,140	37,000	.64	....	
502,360	38,000	.71	....	
515,580	39,000	.80	....	
528,800	40,000	.90	....	
542,020	41,000	1.02	....	
566,600	42,860	....	....	Tensile strength.

Sheared the rivets in one plane in Plate A.
Started a fracture at side of one rivet hole in outside row of riveting.

Maximum stress on joint.

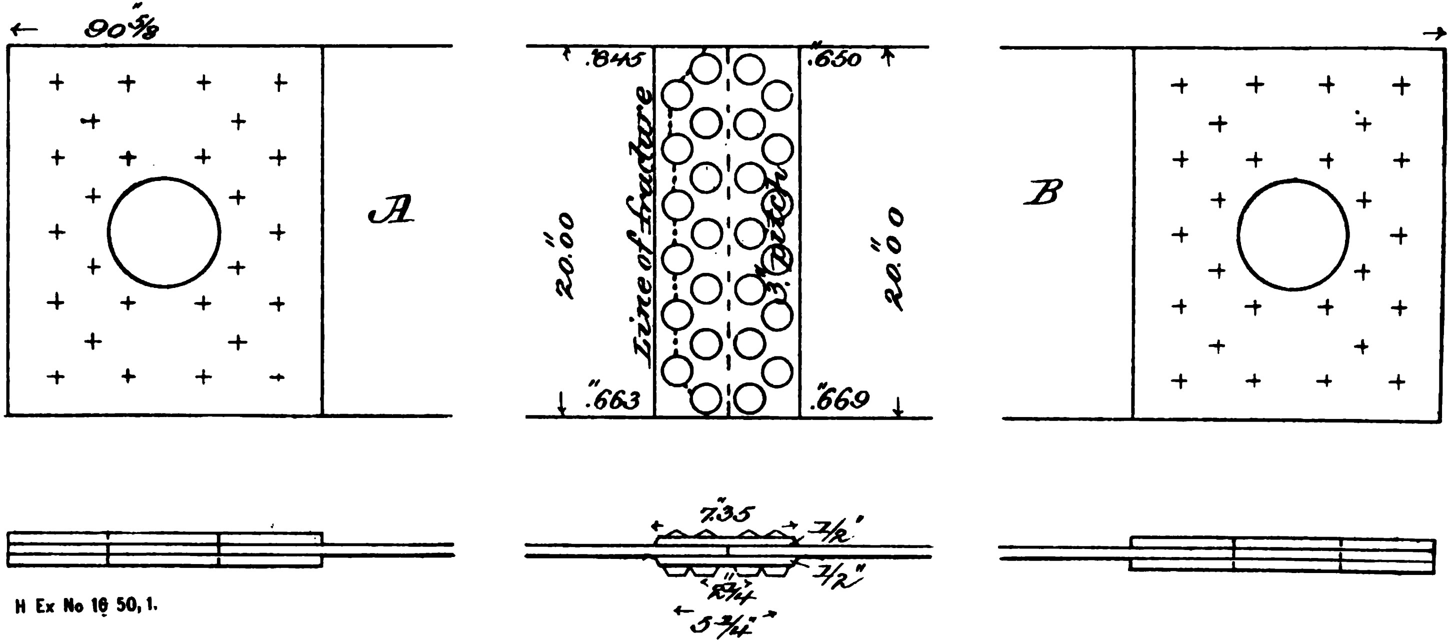
Tension on gross section of plate....................pounds per square inch.. 42,[illegible]
Tension on net section of plate....................do...... 55,[illegible]
Compression on bearing surface of rivets....................do...... 84,[illegible]
Shearing on rivets....................do...... 45,[illegible]

No. 910 Joint A1



H Ex No 16 50, 1.

No. 971 Joint Ar



H Ex No 16 50, 1.

No. 911.

($\frac{3}{4}$" steel rivets; $\frac{25}{32}$" drilled holes.)

Areas.

Plate A, gross sectional area	square inches..	13.08
Plate A, net sectional area	do. ...	10.01
Plate A, bearing surface of rivets	do.....	6.64
Rivets, shearing area	do.....	12.46

Gauged length, 15".

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
13,080	1,000	0.	0.	Initial load.
26,160	2,000	.0002	....	
39,240	3,000	.0005	....	
52,320	4,000	.0010	....	
65,400	5,000	.0015	.0005	
78,480	6,000	.0023	....	
91,560	7,000	.0035	....	
104,640	8,000	.0043	....	
117,720	9,000	.0054	....	
130,800	10,000	.0078	.0048	
143,880	11,000	.0110	....	
156,960	12,000	.0130	....	
170,040	13,000	.0155	....	
183,120	14,000	.0171	....	
196,200	15,000	.0187	.0129	
209,280	16,000	.0204	....	
222,360	17,000	.0220	....	
235,440	18,000	.0239	....	
248,520	19,000	.0265	....	
261,600	20,000	.0283	.0191	
274,680	21,000	.0341	....	
287,760	22,000	.0395	....	
300,840	23,000	.0461	....	
313,920	24,000	.0600	....	
327,000	25,000	.0855	.0680	
340,080	26,000	.1103	....	
353,160	27,000	.1325	....	
366,240	28,000	.1575	....	
379,320	29,000	.19	....	
392,400	30,000	.22	....	
405,480	31,000	.27	....	
418,560	32,000	.35	....	
431,640	33,000	.42	....	Rested under zero load ½ hour.
444,720	34,000	.48	....	
457,800	35,000	.56	....	
470,880	36,000	.62	....	
483,960	37,000	.69	....	
497,040	38,000	.79	....	
510,120	39,000	.89	....	
523,200	40,000	1.01	....	
535,800	40,960	....	....	Tensile strength.

Fractured plate A along outside row of rivet holes. Appearance of fractures, silky, lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	40,960
Tension on net section of plate	do........	53,530
Compression on bearing surface of rivets	do........	80,690
Shearing on rivets	do........	43,000

No. 912.

($\frac{3}{4}$" steel rivets; $\frac{25}{32}$" drilled holes.)

Areas.

Plate A, gross sectional area	square inches	12.41
Plate A, net sectional area	do	9.50
Plate A, bearing surface of rivets	do	6.30
Rivets, shearing area	do	12.46

Gauged length, 15".

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
12,410	1,000	0.	0.	Initial load.
24,820	2,000	.0001	....	
37,230	3,000	.0006	....	
49,640	4,000	.0010	....	
62,050	5,000	.0017	.0005	
74,460	6,000	.0027	....	
86,870	7,000	.0037	....	Rested under load five minutes.
99,280	8,000	.0052	....	
111,690	9,000	.0067	....	
124,100	10,000	.0085	.0048	
136,510	11,000	.0103	....	
148,920	12,000	.0123	....	
161,330	13,000	.0147	....	
173,740	14,000	.0175	....	
186,150	15,000	.0199	.0125	
198,560	16,000	.0222	....	
210,970	17,000	.0250	....	
223,380	18,000	.0270	....	
235,790	19,000	.0297	....	
248,200	20,000	.0322	.0208	
260,610	21,000	.0368	....	
273,020	22,000	.0395	....	
285,430	23,000	.0445	....	
297,840	24,000	.0532	....	
310,250	25,000	.0642	.0455	
322,660	26,000	.0850	....	
335,070	27,000	.1052	....	
347,480	28,000	.1275	....	
359,890	29,000	.1510	....	
372,300	30,000	.17	....	
384,710	31,000	.22	....	
397,120	32,000	.27	....	
409,530	33,000	.32	....	
421,940	34,000	.37	....	
434,350	35,000	.43	....	
446,760	36,000	.49	....	
459,170	37,000	.56	....	
471,580	38,000	.62	....	
483,990	39,000	.71	....	
496,400	40,000	.80	....	
508,810	41,000	.91	....	
521,220	42,000	1.05	....	
530,100	42,720	....	....	Tensile strength.

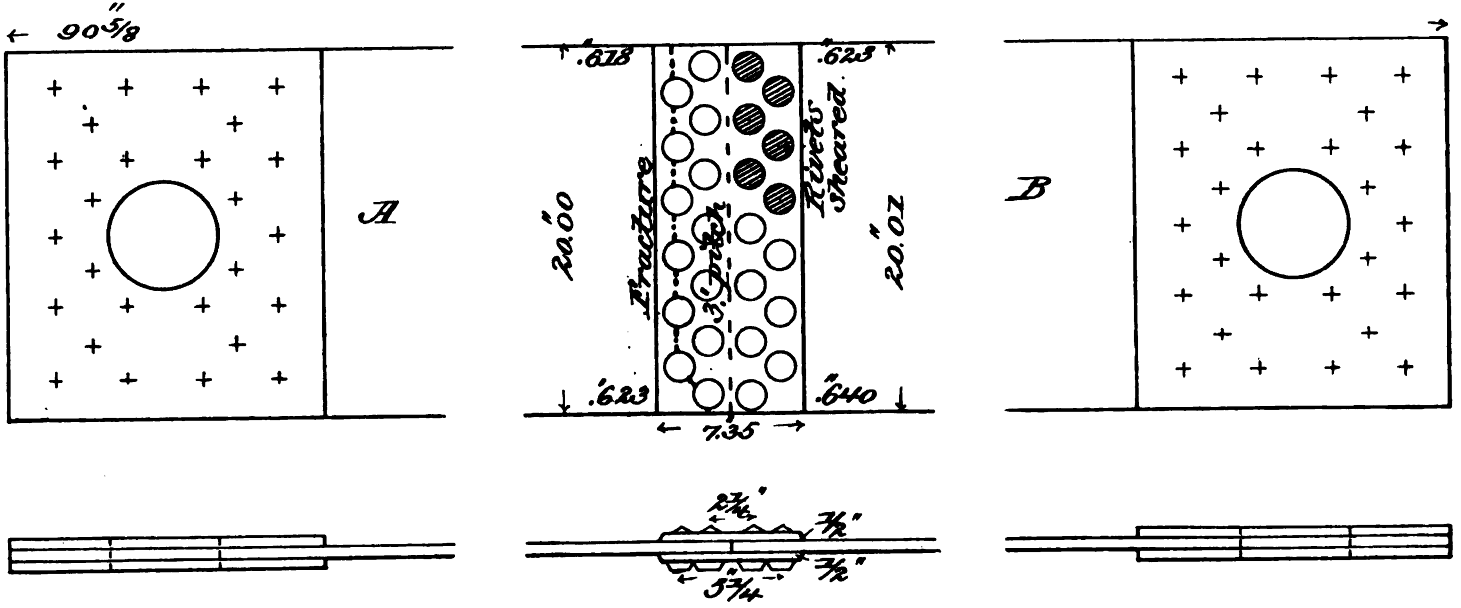
Fractured plate A along outside row of rivet holes; sheared (double shear) six rivets in plate B.

Appearance of fractures, silky, slight lamination.

Maximum stress on joint.

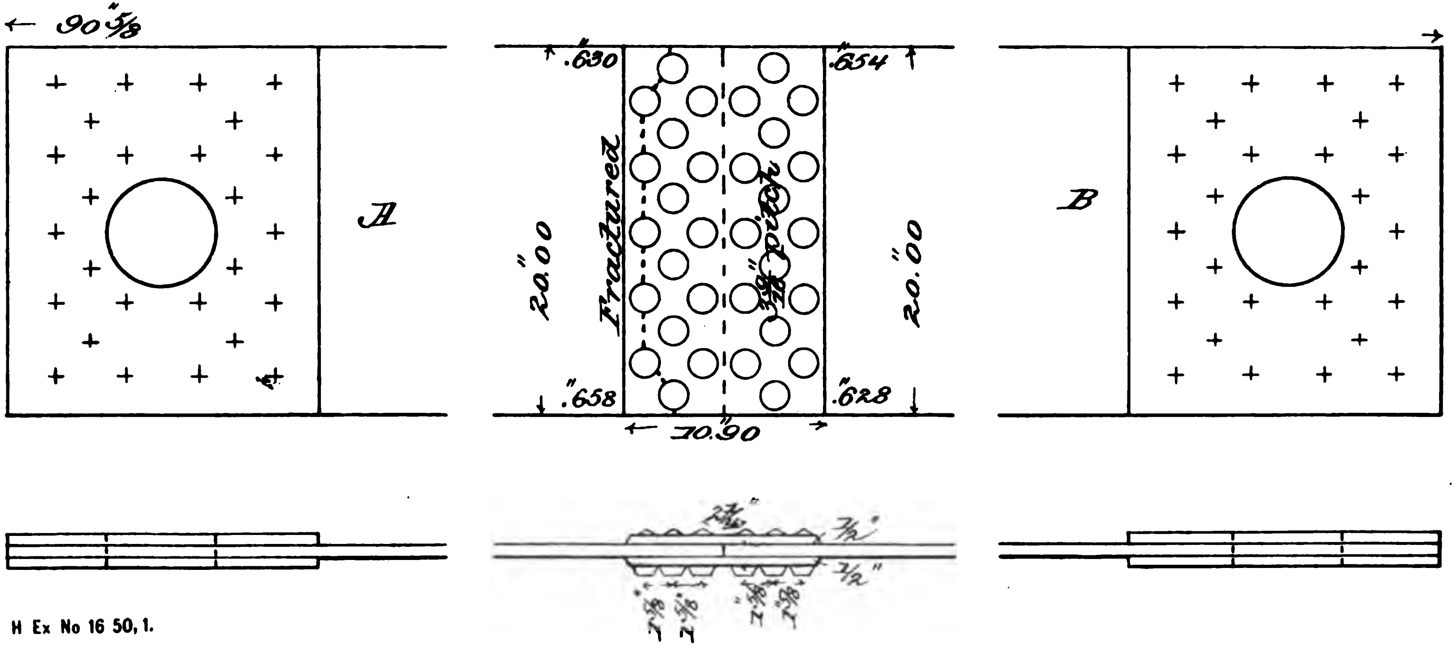
Tension on gross section of plate	pounds per square inch	42,720
Tension on net section of plate	do	55,800
Compression on bearing surface of rivets	do	84,140
Shearing on rivets	do	42,540

No. 912 Joint A3



No. 913.

Joint B1



H Ex No 16 50, 1.

No. 913.

(3/4" steel rivets; 25/32" drilled holes.)

Areas.

Plate B, gross sectional area ....square inches.. 12.82
Plate B, net sectional area....................................do..... 10.81
Plate B, bearing surface of rivets.............................do..... 8.01
Rivets, shearing area..do..... 15.34

Gauged length, 15".
Plate convex on the micrometer side.

Applied loads.		In gauged lengths.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
12,820	1,000	0.	0.	Initial load.
25,640	2,000	.0000	....	
38,460	3,000	.0002	....	
51,280	4,000	.0006	....	
64,100	5,000	.0008	0.	
76,920	6,000	.0010	....	
89,740	7,000	.0015	....	
102,560	8,000	.0021	....	
115,380	9,000	.0024	....	
128,200	10,000	.0030	.0009	
141,020	11,000	.0040	....	
153,840	12,000	.0071	....	
166,660	13,000	.0102	....	
179,480	14,000	.0123	....	
192,300	15,000	.0138	.0091	
205,120	16,000	.0150	....	
217,940	17,000	.0163	....	
230,760	18,000	.0176	....	
213,580	19,000	.0190	....	
256,400	20,000	.0210	.0137	
269,220	21,000	.0234	....	
282,040	22,000	.0255	....	
294,860	23,000	.0296	....	
307,680	24,000	.0367	....	
320,500	25,000	.0450	.0320	
333,320	26,000	.0552	....	
346,140	27,000	.0690	....	
358,960	28,000	.0860	....	
371,780	29,000	.1140	....	
384,600	30,000	.1410	....	
397,420	31,000	.17	....	
410,240	32,000	.21	....	
423,060	33,000	.24	....	
435,880	34,000	.27	....	
448,700	35,000	.30	....	
461,520	36,000	.35	....	
474,340	37,000	.38	....	
487,160	38,000	.43	....	
499,980	39,000	.48	....	
512,800	40,000	.54	....	
525,620	41,000	.61	....	
538,440	42,000	.70	....	
551,260	43,000	.81	....	
557,200	43,460	....	....	Tensile strength.

Fractured plate A along outside row of rivet holes. Appearance of fractures, silky.

Maximum stress on joint.

Tension on gross section of plate ....pounds per square inch.. 43,460
Tension on net section of plate..do........ 54,040
Compression on bearing surface of rivets.................................do........ 69,560
Shearing on rivets...do........ 36,320

No. 914.

($\frac{3}{4}''$ steel rivets; $\frac{25}{32}''$ drilled holes.)

Areas.

Plate B, gross sectional area	square inches..	12.69
Plate B, net sectional area	do.....	10.21
Plate B, bearing surface of rivets	do.....	7.93
Rivets, shearing area	do.....	15.34

Gauged length, 15″.

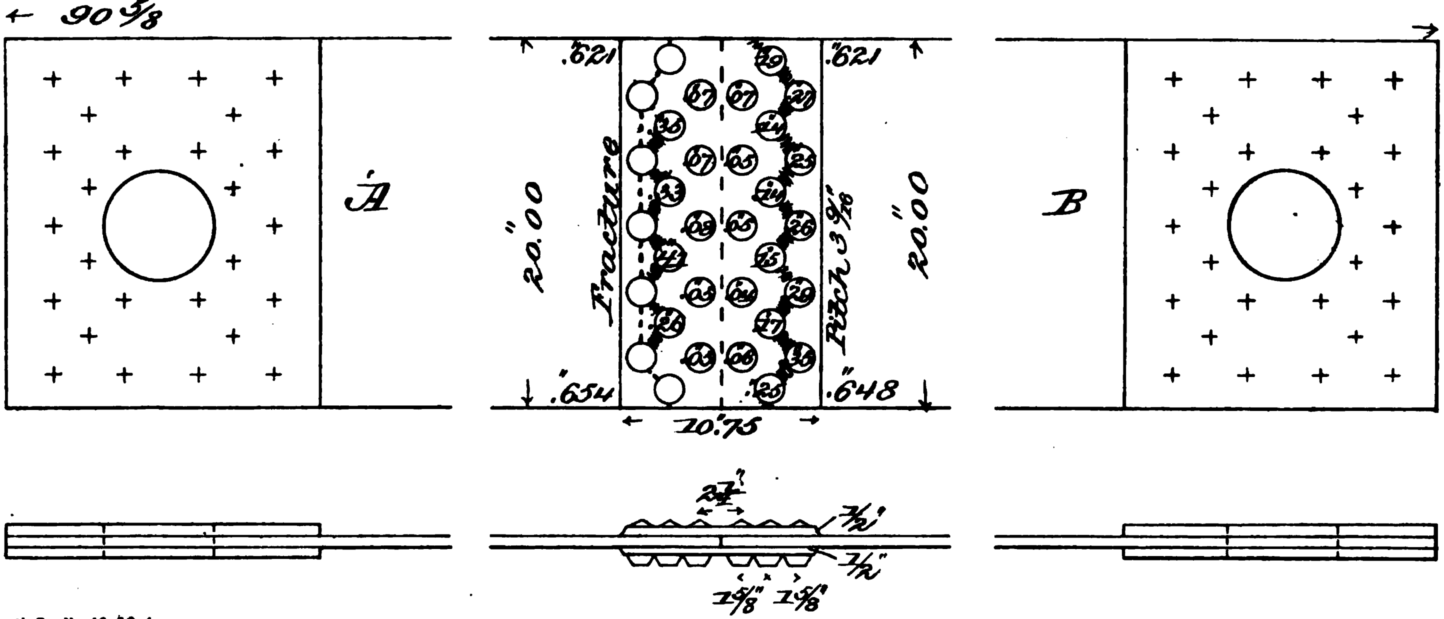
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
12, 690	1, 000	0.	0.	Initial load.
25, 380	2, 000	.0001	....	
38, 070	3, 000	.0002	....	
50, 760	4, 000	.0004	....	
63, 450	5, 000	.0007	.0007	
76, 140	6, 000	.0012	....	
88, 830	7, 000	.0022	....	
101, 520	8, 000	.0028	....	
114, 210	9, 000	.0035	....	
126, 900	10, 000	.0048	.0020	
139, 590	11, 000	.0055	....	
152, 280	12, 000	.0073	....	
164, 970	13, 000	.0098	....	
177, 660	14, 000	.0145	....	
190, 350	15, 000	.0161	.0115	
203, 040	16, 000	.0175	....	
215, 730	17, 000	.0191	....	
228, 420	18, 000	.0207	....	
241, 110	19, 000	.0223	....	
253, 800	20, 000	.0247	.0168	
266, 490	21, 000	.0278	....	
279, 180	22, 000	.0306	....	
291, 870	23, 000	.0380	....	
304, 560	24, 000	.0470	....	
317, 250	25, 000	.0595	.0467	
329, 940	26, 000	.0745	....	
342, 630	27, 000	.0952	....	
355, 320	28, 000	.1245	....	
368, 010	29, 000	.1550	....	
380, 700	30, 000	.19	....	
393, 390	31, 000	.22	....	
406, 080	32, 000	.25	....	
418, 770	33, 000	.28	....	
431, 460	34, 000	.32	....	
444, 150	35, 000	.37	....	
456, 840	36, 000	.42	....	
469, 530	37, 000	.48	....	
482, 220	38, 000	.54	....	
494, 910	39, 000	.62	....	
507, 600	40, 000	.72	....	
512, 500	40, 390	....	....	Tensile strength.

Fractured plate A along outside row of rivet holes. Appearance of fractures, silky, slightly lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	40, 390
Tension on net section of plate	do........	50, 200
Compression on bearing surface of rivets	do........	64, 630
Shearing on rivets	do........	33, 410

No. 914 Joint B2

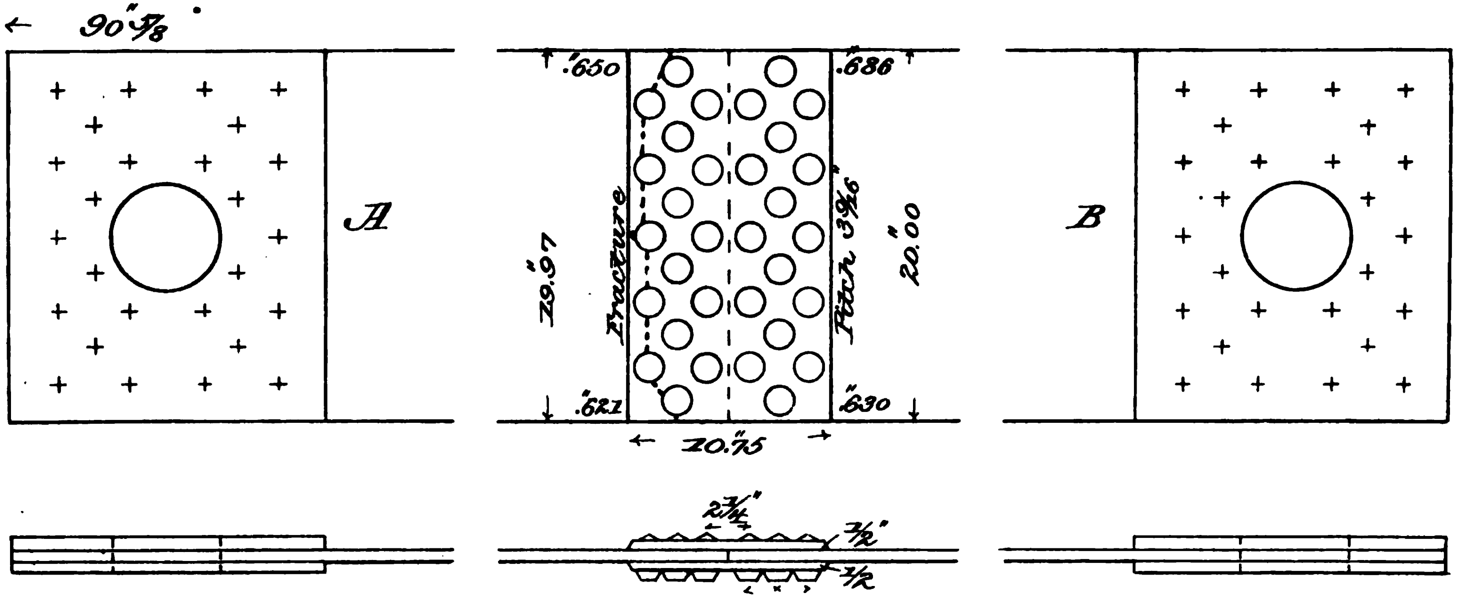


H Ex No 16 50, 1.

Elongation of rivet holes shown by the figures on the sketch.
Metal thinned down along the shaded lines.

No. 915

Joint B3



H Ex No 16 50, 1.

No. 915.

($\frac{7}{8}$" steel rivets; $\frac{15}{16}$" drilled holes.)

Areas.

Plate A, gross sectional area	square inches..	12.691
Plate A, net sectional area	do....	10.21
Plate, A, bearing surface of rivets	do....	7.94
Rivets, shearing area	do....	15.34

Gauged length, 15".

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
12,691	1,000	0.	0.	Initial load.
25,382	2,000	.0002	....	
38,073	3,000	.0007	....	
50,764	4,000	.0009	....	
63,455	5,000	.0014	.0002	
76,146	6,000	.0020	....	
88,837	7,000	.0025	....	
101,528	8,000	.0030	....	
114,219	9,000	.0038	....	
126,910	10,000	.0044	.0013	
139,601	11,000	.0052	....	
152,292	12,000	.0060	....	
164,983	13,000	.0066	....	
177,674	14,000	.0075	....	
190,365	15,000	.0090	.0038	
203,056	16,000	.0108	....	
215,747	17,000	.0118	....	
228,438	18,000	.0168	....	Sudden yielding of the joint, shown by scale beam suddenly dropping.
241,129	19,000	.0180	....	
253,820	20,000	.0200	.0123	
266,511	21,000	.0221	....	
279,202	22,000	.0241	....	
291,893	23,000	.0263	....	
304,584	24,000	.0290	....	
317,275	25,000	.0336	.0226	
329,966	26,000	.0418	....	
342,657	27,000	.0540	....	
355,348	28,000	.0661	....	
368,039	29,000	.0830	....	
380,730	30,000	.1100	....	
393,421	31,000	.1425	....	
406,112	32,000	.17	....	
418,803	33,000	.20	....	
431,494	34,000	.24	....	
444,185	35,000	.27	....	
456,876	36,000	.29	....	
469,567	37,000	.34	....	
482,258	38,000	.38	....	
494,949	39,000	.43	....	
507,640	40,000	.48	....	
520,331	41,000	.53	....	
533,022	42,000	.60	....	
545,713	43,000	.70	....	
558,404	44,000	.81	....	
562,100	44,290	....	....	Tensile strength.

Fractured plate along outside row of rivet holes. Appearance of fractures, silky, lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	44,290
Tension on net section of plate	do........	55,050
Compression on bearing surface of rivets	do........	70,790
Shearing on rivets	do........	36,640

No. 916.

(1″ steel rivets; $1\frac{1}{16}$″ drilled holes.)

Areas.

Plate B, gross sectional area	square inches	14.671
Plate B, net sectional area	do	10.09
Plate B, bearing surface of rivets	do	8.25
Rivets, shearing area	do	15.96

Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
14,671	1,000	0.	0.	Initial load.
29,342	2,000	.0005	....	
44,013	3,000	.0010	....	
58,684	4,000	.0014	....	
73,355	5,000	.0019	.0002	
88,026	6,000	.0028	....	
102,697	7,000	.0035	....	
117,368	8,000	.0045	....	
132,039	9,000	.0066	....	
146,710	10,000	.0088	.0050	
161,381	11,000	.0105	....	
176,052	12,000	.0123	....	
190,723	13,000	.0145	....	
205,394	14,000	.0205	....	
220,065	15,000	.0231	.0165	
234,736	16,000	.0260	....	
249,407	17,000	.0290	....	
264,078	18,000	.0329	....	
278,749	19,000	.0382	....	
293,420	20,000	.0470	.0350	
308,091	21,000	.0670	....	
322,762	22,000	.0938	....	
337,433	23,000	.1245	....	
352,104	24,000	.1575	....	
366,775	25,000	.20	....	
381,446	26,000	.27	....	
396,117	27,000	.31	....	
410,788	28,000	.37	....	
425,459	29,000	.43	....	
440,130	30,000	.48	....	
454,801	31,000	.55	....	
469,472	32,000	.63	....	
484,143	33,000	.73	....	
498,814	34,000	.80	....	
513,485	35,000	1.16	....	Fracture opened in edge of plate B.
516,100	35,180	....	....	Tensile strength.

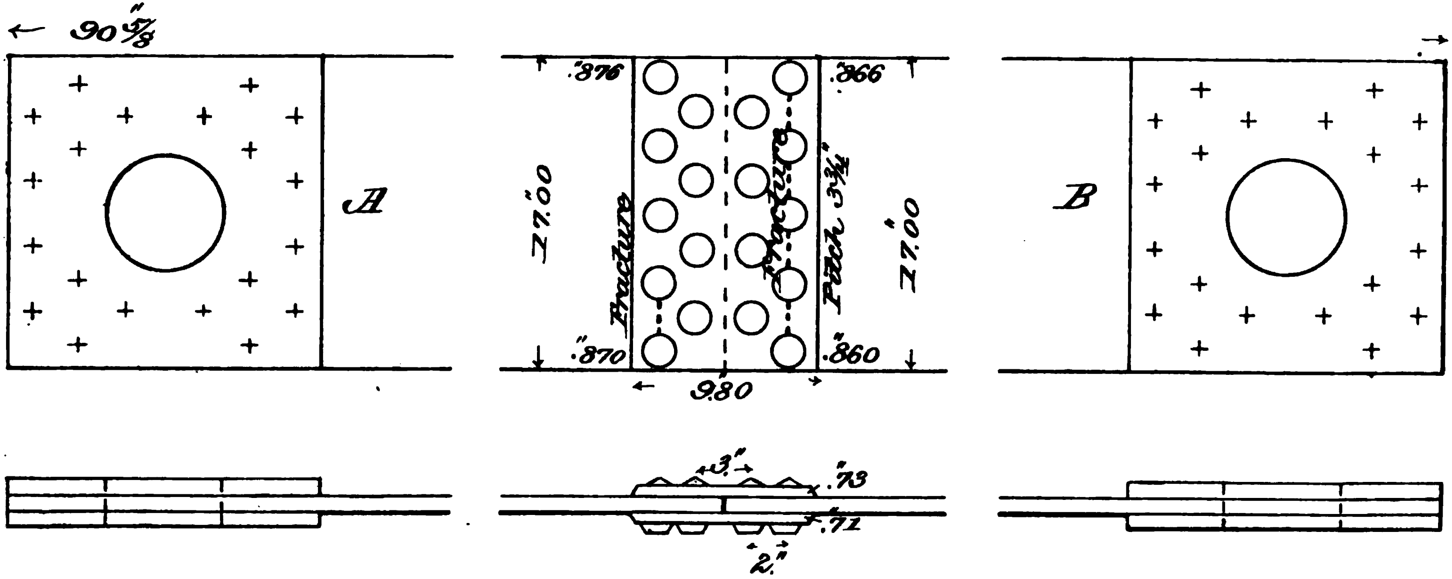
Fractured plate B along outside row of rivet holes; tore apart from one edge. Fractures also started in plate A at opposite edge. Appearance of fractures, silky, lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch	35,180
Tension on net section of plate	do	51,150
Compression on bearing surface of rivets	do	62,560
Shearing on rivets	do	32,340

No. 916

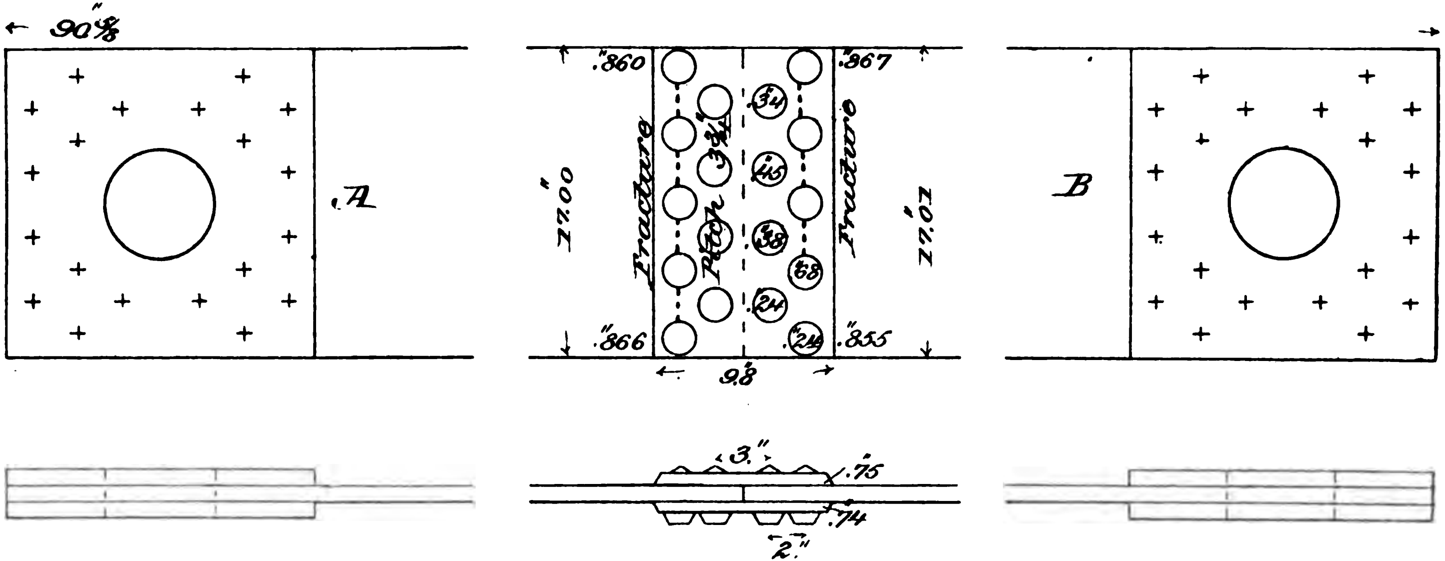
Joint D2



H Ex No 16.50, 1.

No. 927

Joint D2



H Ex No 16 50, 1.

No. 917.

(1″ steel rivets; $1\frac{1}{16}$″ drilled holes.)

Areas.

Plate B, gross sectional area	square inches..	14.646
Plate B, net sectional area	do......	10.07
Plate B, bearing surface of rivets	do......	8.23
Rivets, shearing area	do......	15.96

Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
14,646	1,000	0.	0.	Initial load.
29,292	2,000	0.	....	
43,938	3,000	.0004	....	
58,584	4,000	.0008	....	
73,230	5,000	.0017	.0006	
87,876	6,000	.0021	....	
102,522	7,000	.0030	....	
117,168	8,000	.0035	....	
131,814	9,000	.0051	....	
146,460	10,000	.0065	.0055	
161,106	11,000	.0112	....	
175,752	12,000	.0136	....	
190,398	13,000	.0187	....	
205,044	14,000	.0208	....	
219,690	15,000	.0253	.0174	
234,336	16,000	.0265	....	
248,982	17,000	.0294	....	
263,628	18,000	.0340	....	
278,274	19,000	.0385	....	
292,920	20,000	.0455	.0340	
307,566	21,000	.0585	....	
322,212	22,000	.0815	....	
336,858	23,000	.1055	....	
351,504	24,000	.1365	....	
366,150	25,000	.17	....	
380,796	26,000	.20	....	
395,442	27,000	.27	....	
410,088	28,000	.33	....	
424,734	29,000	.37	....	
439,380	30,000	.42	....	
454,026	31,000	.50	....	
468,672	32,000	.55	....	
483,318	33,000	.59	....	
497,964	34,000	.64	....	
512,610	35,000	.79	....	
525,600	35,890	.92	....	
527,256	36,000	.96	....	
530,100	36,190	....	....	Tensile strength.

Fractured both plates along outside row of rivet holes. The separation of plate A was complete; plate B fractured through four sections. Appearance of fractures, silky; slightly lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	36,190
Tension on net section of plate	do........	52,640
Compression on bearing surface of rivets	do........	64,410
Shearing on rivets	do........	33,210

No. 918.

(1″ steel rivets; $1\frac{1}{16}$″ drilled holes.)

Areas.

Plate A, gross sectional area	square inches..	14.705
Plate A, net sectional area	do	10.11
Plate A, bearing surface of rivets	do......	8.27
Rivets, shearing area	do......	15.96

Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
14,705	1,000	0.	0.	Initial load.
29,400	2,000	.0004	....	
44,115	3,000	.0007	....	
58,820	4,000	.0013	....	
73,525	5,000	.0020	.0006	
88,230	6,000	.0025	....	
102,935	7,000	.0030	....	
117,640	8,000	.0035	....	
132,345	9,000	.0040	....	
147,050	10,000	.0050	.0022	
161,755	11,000	.0079	....	
176,460	12,000	.0160	....	
191,165	13,000	.0188	....	
205,870	14,000	.0218	....	
220,575	15,000	.0240	.0179	
235,280	16,000	.0265	....	
249,985	17,000	.0298	....	
264,690	18,000	.0340	....	
279,395	19,000	.0390	....	
294,100	20,000	.0473	.0365	
308,805	21,000	.0670	....	
323,510	22,000	.0960	....	
338,215	23,000	.1200	....	
352,920	24,000	.1550	....	
367,625	25,000	.19	....	
382,330	26,000	.23	....	
397,035	27,000	.29	....	
411,740	28,000	.34	....	
426,445	29,000	.40	....	
441,150	30,000	.46	....	
455,855	31,000	.52	....	
470,560	32,000	.59	....	
485,265	33,000	.67	....	
499,970	34,000	.77	....	
514,675	35,000	.88	....	
526,200	35,780	....	....	Tensile strength.

Fractured plates along outside rows of rivet holes. Plate B did not separate at one edge.

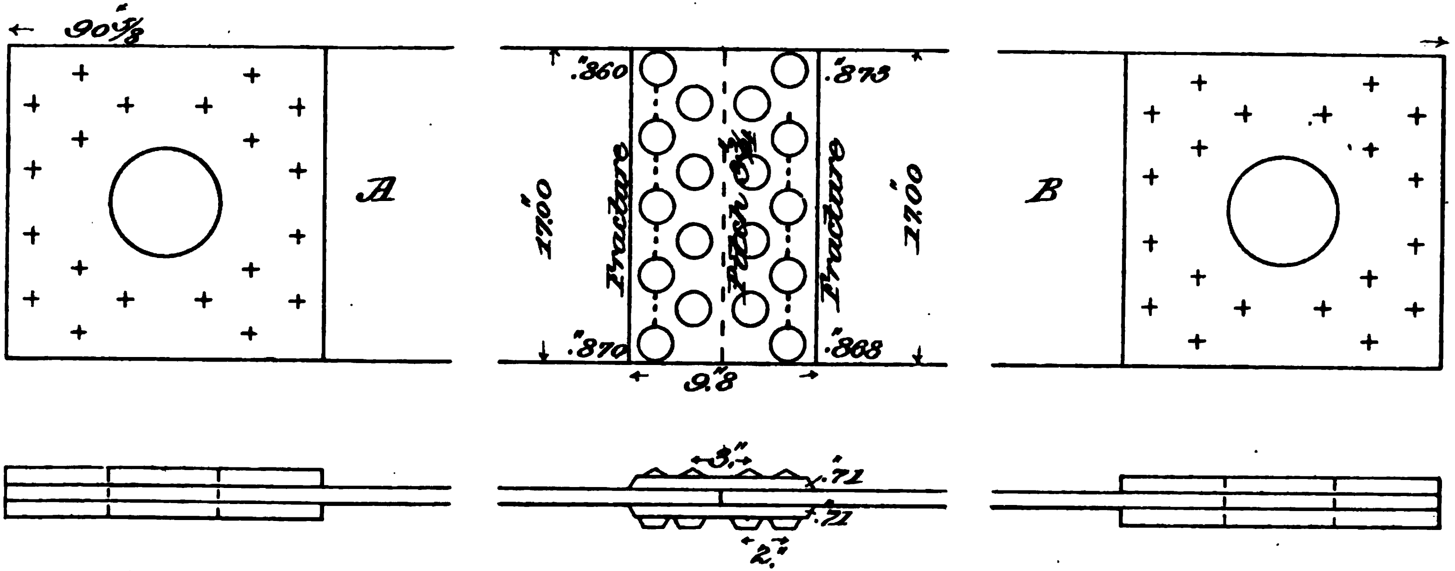
Appearance of fractures silky, slightly lamellar; metal well drawn down.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	35,780
Tension on net section of plate	do......	52,050
Compression on bearing surface of rivets	do......	63,630
Shearing on rivets	do......	32,970

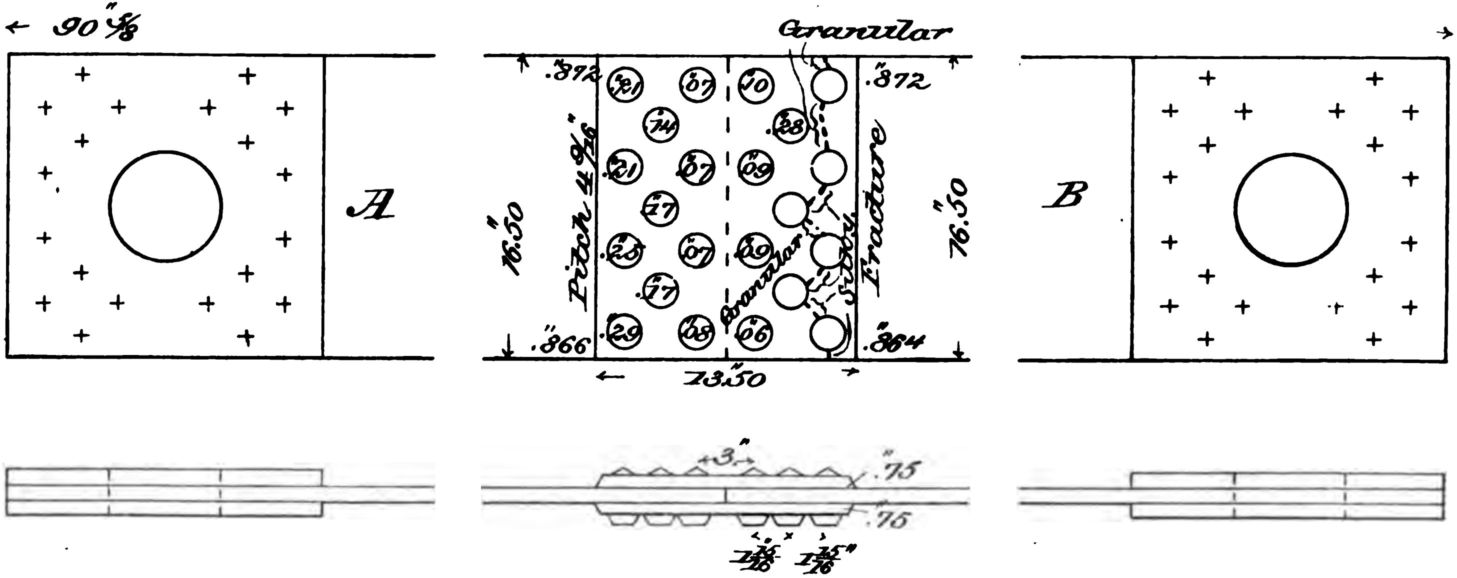
No. 918

Joint D 3



No. 919

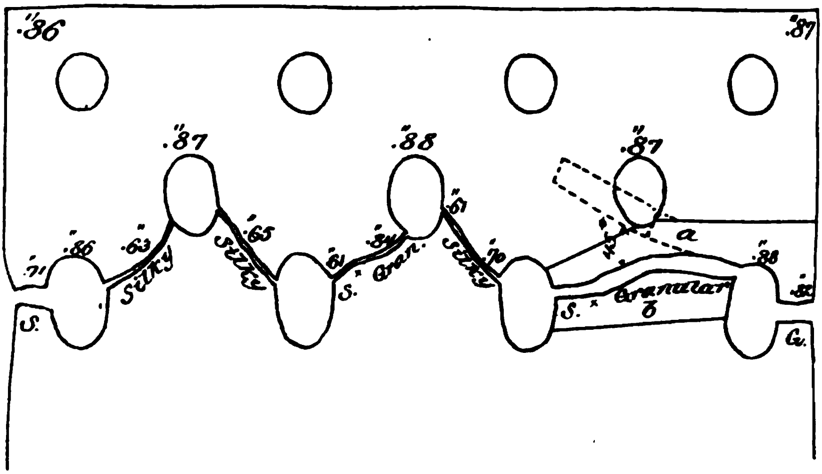
Joint F:1



H Ex No 16 50, 1.

No. 919 Joint E1

End of plate B after fracture



Figures on sketch indicate thickness of metal of fractured plate.

Piece a bent cold, perpendicular to the Surface of fracture, 45°, then it broke. Piece b bent cold, parallel to the surface of fracture, 150°; then sheared the metal at the silky end.

No. 919.

(1″ steel rivets; $1\frac{1}{16}$″ drilled holes.)

Areas.

Plate B, gross sectional area	square inches..	14.322
Plate B, net sectional area	do......	10.63
Plate B, bearing surface of rivets	do......	10.15
Rivets, shearing area	do......	19.51

Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
14,322	1,000	0.	0.	Initial load.
28,644	2,000	.0002	....	
42,966	3,000	.0005	....	
57,288	4,000	.0009	....	
71,610	5,000	.0012	0.	
85,932	6,000	.0015	....	
100,254	7,000	.0020	....	
114,576	8,000	.0027	....	
128,898	9,000	.0034	....	
143,220	10,000	.0040	.0010	
157,542	11,000	.0049	....	
171,864	12,000	.0062	....	
186,186	13,000	.0074	....	
200,508	14,000	.0141	....	
214,830	15,000	.0164	.0110	
229,152	16,000	.0184	....	
243,474	17,000	.0204	....	
257,796	18,000	.0222	....	
272,118	19,000	.0244	....	
286,440	20,000	.0265	.0184	
300,762	21,000	.0296	....	
315,084	22,000	.0335	....	
329,406	23,000	.0398	....	
343,728	24,000	.0582	....	
358,050	25,000	.0765	.0615	
372,372	26,000	.1045	....	
386,694	27,000	.1236	....	
401,016	28,000	.1595	....	
415,338	29,000	.20	....	
429,660	30,000	.22	....	
443,982	31,000	.25	....	
458,304	32,000	.30	....	
472,626	33,000	.34	....	
486,948	34,000	.37	....	
501,370	35,000	.44	....	
515,692	36,000	.48	....	
530,014	37,000	.55	....	
537,200	37,510	.61	....	
543,000	37,910	....	....	Tensile strength.

Fractured plate B, taking zigzag course through two outside rows of rivet holes.

Appearance of fractures, silky in part, granular in part. The metal in the silky sections well drawn down, the granular sections not much reduced in thickness of plate; the extremes of thickness after fracture being ″.665 in the silky and ″.840 in the granular metal.

A loud report accompanied the fracture of the granular metal.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	37,910
Tension on net section of plate	do........	51,080
Compression on bearing surface of rivets	do........	53,500
Shearing on rivets	do........	27,830

No. 920.

(1″ steel rivets; $1\frac{1}{16}$″ drilled holes.)

Areas.

Plate A, gross sectional area	square inches	14.438
Plate A, net sectional area	do	10.72
Plate A, bearing surface of rivets	do	10.23
Rivets, shearing area	do	19.51

Gauged length, 15″.

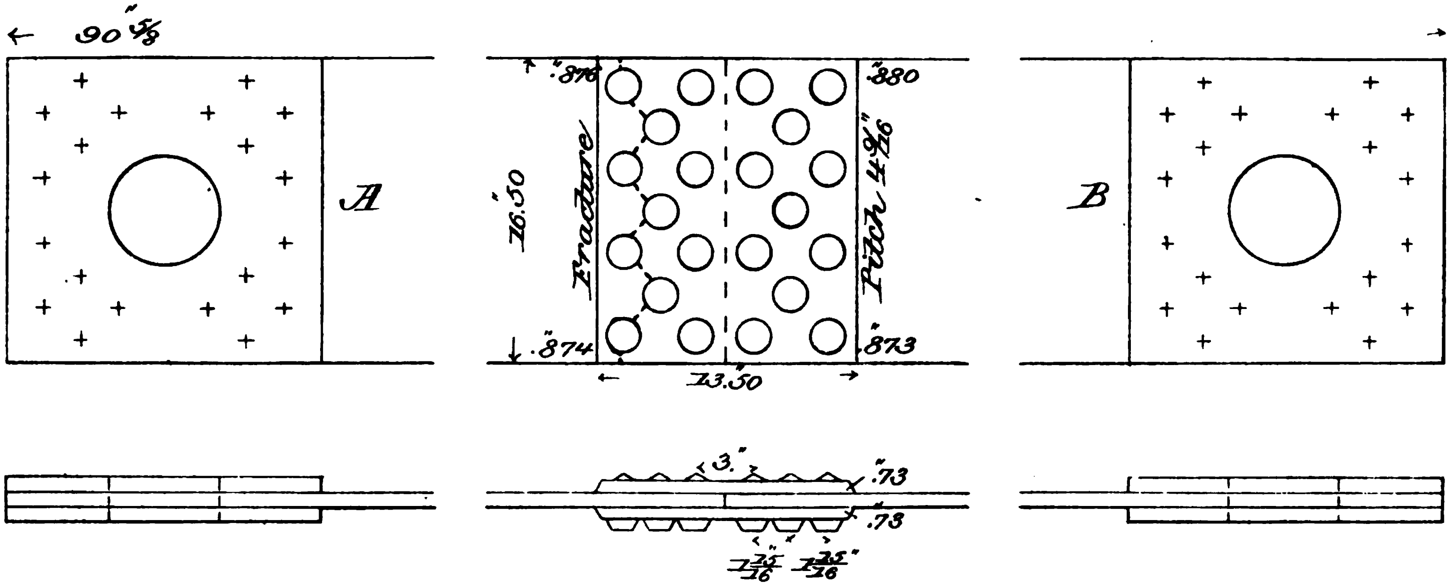
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
14,438	1,000	0.	0.	Initial load.
28,876	2,000	.0000	....	
43,314	3,000	.0005	....	
57,752	4,000	.0008	....	
72,190	5,000	.0015	.0000	
86,628	6,000	.0019	....	
101,066	7,000	.0023	....	
115,504	8,000	.0028	....	
129,942	9,000	.0033	....	
144,380	10,000	.0040	.0006	
158,818	11,000	.0046	....	
173,256	12,000	.0059	....	
187,694	13,000	.0085	....	
202,132	14,000	.0112	....	
216,570	15,000	.0179	.0125	
231,008	16,000	.0204	....	
245,446	17,000	.0228	....	
259,884	18,000	.0252	....	
274,322	19,000	.0280	....	
288,760	20,000	.0311	.0229	
303,198	21,000	.0355	....	
317,636	22,000	.0420	....	
332,074	23,000	.0531	....	
346,512	24,000	.0830	....	
360,950	25,000	.1066	....	
375,388	26,000	.1332	....	
389,826	27,000	.1585	....	
404,264	28,000	.19	....	
418,702	29,000	.23	....	
433,140	30,000	.27	....	
447,578	31,000	.31	....	
462,016	32,000	.36	....	
476,454	33,000	.40	....	
490,892	34,000	.44	....	
505,330	35,000	.51	....	
519,768	36,000	.57	....	
534,206	37,000	.65	....	
548,644	38,000	.75	....	
554,400	38,400	....	....	Tensile strength.

Fractured plate A, taking a zigzag course through two outer rows of rivet holes. Appearance of fractures, silky, slightly lamellar.

Maximum stress on joint.

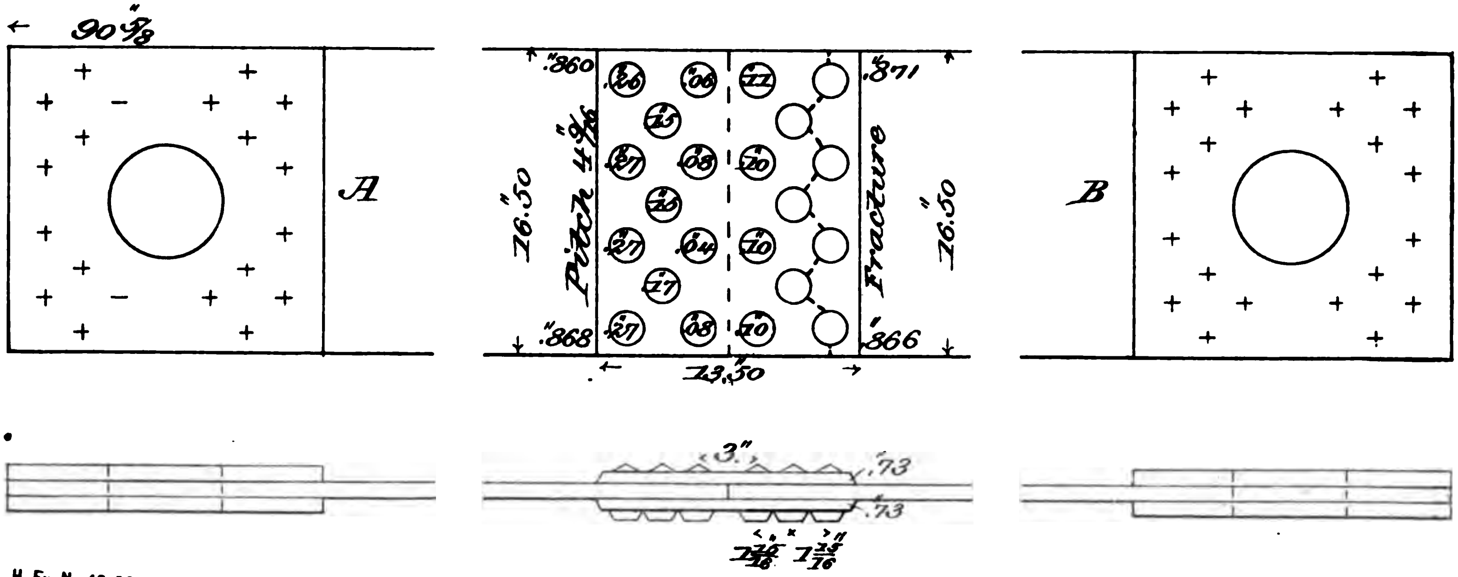
Tension on gross section of plate	pounds per square inch	38,400
Tension on net section of plate	do	51,720
Compression on bearing surface of rivets	do	54,190
Shearing on rivets	do	28,420

No. 920 Joint E2



H Ex No 16 50, 1.

No. 921 Joint E3



H Ex No 16 50, 1.

No. 921.

(1″ steel rivets; $1\frac{1}{16}$″ drilled holes.)

Areas.

Plate A, gross sectional area	square inches	14.256
Plate A, net sectional area	do	10.58
Plate A, bearing surface of rivets	do	10.10
Rivets, shearing area	do	19.51

Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
14,256	1,000	0.	0.	Initial load.
28,512	2,000	.0002	....	
42,768	3,000	.0005	....	
57,024	4,000	.0010	....	
71,280	5,000	.0016	.0006	
85,536	6,000	.0023	....	
99,792	7,000	.0029	....	
114,048	8,000	.0038	....	
128,304	9,000	.0050	....	
142,560	10,000	.0060	.0033	
156,816	11,000	.0080	....	
171,072	12,000	.0099	....	
185,328	13,000	.0128	....	
199,584	14,000	.0168	....	
213,840	15,000	.0189	.0139	
228,096	16,000	.0211	....	
242,352	17,000	.0235	....	
256,608	18,000	.0256	....	
270,864	19,000	.0280	....	
285,120	20,000	.0312	.0225	
299,376	21,000	.0355	....	
313,632	22,000	.0405	....	
327,888	23,000	.0495	....	
342,144	24,000	.0708	....	
356,400	25,000	.1020	....	
370,656	26,000	.1270	....	
384,912	27,000	.1585	....	
399,168	28,000	.18	....	
413,424	29,000	.22	....	
427,680	30,000	.25	....	
441,936	31,000	.29	....	
456,192	32,000	.34	....	
470,448	33,000	.38	....	
484,704	34,000	.46	....	
498,960	35,000	.51	....	
513,216	36,000	.53	....	
527,472	37,000	.63	....	
541,000	37,950	....	....	Tensile strength.

Fractured plate B, taking zigzag course through two outside rows of rivet holes.

Appearance of fracture, silky, slightly lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch	37,950
Tension on net section of plate	do	51,130
Compression on bearing surface of rivets	do	53,560
Shearing on rivets	do	27,730

No. 922.

(3 plates, $1\frac{1}{16}''$ iron rivets, $1\frac{1}{8}''$ drilled holes; 2 plates, $1\frac{1}{8}''$ iron rivets, $1\frac{1}{4}''$ drilled holes.)

Areas.

Plate A, gross sectional area	square inches..	13.781
Plate A, net sectional area	do......	10.93
Plate A, bearing surface of rivet	do......	16.30
Rivets, shearing area	do......	28.00

Gauged length, 25″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
13,781	1,000	0.	0.	Initial load.
27,562	2,000	.0003	....	
41,343	3,000	.0010	....	
55,124	4,000	.0018	....	
68,905	5,000	.0026	.0005	
82,686	6,000	.0034	....	
96,467	7,000	.0046	....	
110,248	8,000	.0054	....	
124,029	9,000	.0063	....	
137,810	10,000	.0075	.0025	
151,591	11,000	.0094	....	
165,372	12,000	.0105	....	
179,153	13,000	.0118	....	
192,934	14,000	.0138	....	
206,715	15,000	.0174	.0078	
220,496	16,000	.0204	....	
234,277	17,000	.0250	....	
248,058	18,000	.0295	....	
261,839	19,000	.0344	....	
275,620	20,000	.0403	.0253	
289,401	21,000	.0494	....	
303,182	22,000	.0609	....	
316,963	23,000	.0830	....	
330,744	24,000	.1220	....	
344,125	25,000	.1740	....	
358,306	26,000	.20	....	
372,087	27,000	.25	....	
385,868	28,000	.32	....	
399,649	29,000	.37	....	
413,430	30,000	.42	....	
427,211	31,000	.48	....	
440,992	32,000	.55	....	
454,773	33,000	.63	....	
468,554	34,000	.69	....	
482,335	35,000	.80	....	
496,116	36,000	.90	....	
509,897	37,000	1.03	....	
523,678	38,000	1.20	....	
537,459	39,000	1.41	....	
551,240	40,000	1.70	....	
562,400	40,810	2.10	....	Tensile strength.

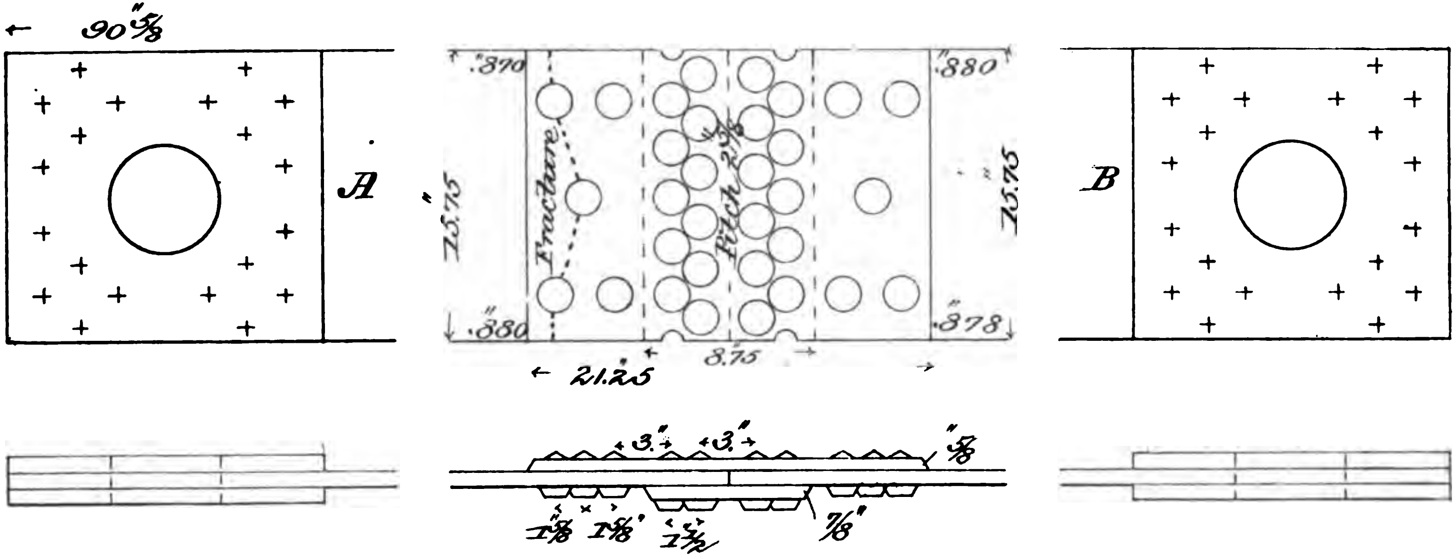
Fractured plate A along outside rows of rivet holes.

Appearance of fractures, silky, slightly lamellar. Mean thickness at fracture, ″.56.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	40, [illegible]
Tension on net section of plate	do........	51, [illegible]
Compression on bearing surface of rivets	do........	34, [illegible]
Shearing on rivets	do........	20, [illegible]

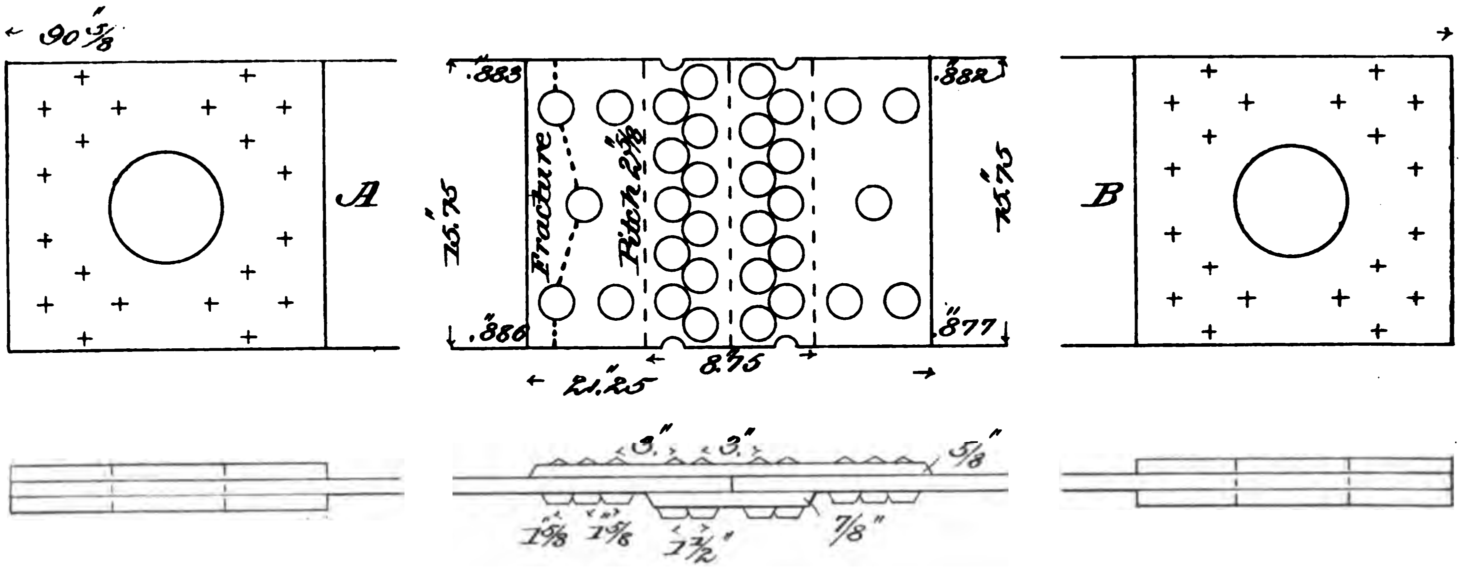
No. 922 Joint G1



H Ex No 16 50.1.

No. 923

Joint G 2



No. 923.

(3 plates, 1$\frac{1}{16}$″ iron rivets, 1$\frac{1}{8}$″ drilled holes; 2 plates, 1$\frac{1}{8}$″ iron rivets, 1$\frac{1}{4}$″ drilled holes.)

Areas.

Plate B, gross sectional area..........................square inches.. 13. 852
Plate B, net sectional area..do...... 10. 985
Plate B. bearing surface of rivets ....do...... 16. 38
Rivets, shearing area ....do...... 28, 00

Gauged length, 25″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
13, 852	1, 000	0.	0.	Initial load.
27, 704	2, 000	.0008	....	
41, 556	3, 000	.0015	....	
55, 408	4, 000	.0024	....	
69, 260	5, 000	.0033	.0009	
83, 112	6, 000	.0039	....	
96, 964	7, 000	.0047	....	
110, 816	8, 000	.0056	....	
124, 668	9, 000	.0067	....	
138, 520	10, 000	.0077	.0020	
152, 372	11, 000	.0092	....	
166, 224	12, 000	.0104	....	
180, 076	13, 000	.0135	....	
193, 928	14, 000	.0163	....	
207, 780	15, 000	.0201	.0105	
221, 632	16, 000	.0236	....	
235, 484	17, 000	.0272	....	
249, 336	18, 000	.0308	....	
263, 188	19, 000	.0360	....	
277, 040	20, 000	.0428	.0275	
290, 892	21, 000	.0525	....	
304, 744	22, 000	.0640	....	
318, 596	23, 000	.0885	....	
332, 448	24, 000	.1300	....	
346, 300	25, 000	.18	....	
360, 152	26, 000	.21	....	
374, 004	27, 000	.26	....	
387, 856	28, 000	.31	....	
401, 708	29, 000	.36	....	
415, 560	30, 000	.42	....	
429, 412	31, 000	.48	....	
443, 264	32, 000	.55	....	
457, 116	33, 000	.61	....	
470, 968	34, 000	.69	....	
484, 820	35, 000	.78	....	
498, 672	46, 000	.90	....	
512, 524	37. 000	1. 02	....	
526, 376	38. 000	1. 15	....	
540, 228	39, 000	1. 31	....	
554, 080	40, 000	1. 54	....	
567, 932	41, 000	1. 85	....	
578, 200	41, 740	2. 40	....	Tensile strength.

Fractured plate A along outside rows of rivet holes. Appearance of fractures, silky, slightly lamellar.

Maximum stress on joint.

Tension on gross section of plate ....pounds per square inch.. 41, 740
Tension on net section of plate...do........ 52, 640
Compression on bearing surface of rivets.......................................do........ 35, 300
Shearing on rivets..do........ 20. 650

No. 924.

(3 plates, 1$\frac{1}{16}$″ iron rivets, 1$\frac{1}{8}$″ drilled holes; 2 plates, 1$\frac{1}{8}$″ iron rivets, 1$\frac{1}{4}$″ drilled holes.)

Areas.

Plate B, gross sectional area	square inches..	13.741
Plate B, net sectional area	do......	10.90
Plate B, bearing surface of rivets	do......	16.26
Rivets, shearing area	do......	28.00

Gauged length, 25″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
13,741	1,000	0.	0.	Initial load.
27,482	2,000	.0005	....	
41,223	3,000	.0011	....	
54,964	4,000	.0020	....	
68,705	5,000	.0027	.0012	
82,446	6,000	.0037	....	
96,187	7,000	.0045	....	
109,928	8,000	.0051	....	
123,669	9,000	.0062	....	
137,410	10,000	.0072	.0019	
151,151	11,000	.0085	....	
164,892	12,000	.0100	....	
178,633	13,000	.0112	....	
192,374	14,000	.0125	....	
206,115	15,000	.0147	.0055	
219,856	16,000	.0185	....	
233,597	17,000	.0237	....	
247,338	18,000	.0296	....	
261,079	19,000	.0360	....	
274,820	20,000	.0425	.0275	
288,561	21,000	.0509	....	
302,302	22,000	.0660	....	
316,043	23,000	.0925	....	
329,784	24,000	.1365	....	
343,525	25,000	.17	....	
357,266	26,000	.21	....	
371,007	27,000	.29	....	
384,748	28,000	.36	....	
398,489	29,000	.41	....	
412,230	30,000	.46	....	
425,971	31,000	.51	....	
439,712	32,000	.60	....	
453,453	33,000	.66	....	
467,194	34,000	.77	....	
480,935	35,000	.88	....	
494,676	36,000	1.01	....	
508,417	37,000	1.17	....	
522,158	38,000	1.35	....	
535,899	39,000	1.60	....	
549,640	40,000	2.08	....	
551,300	40,120	....	....	Tensile strength.

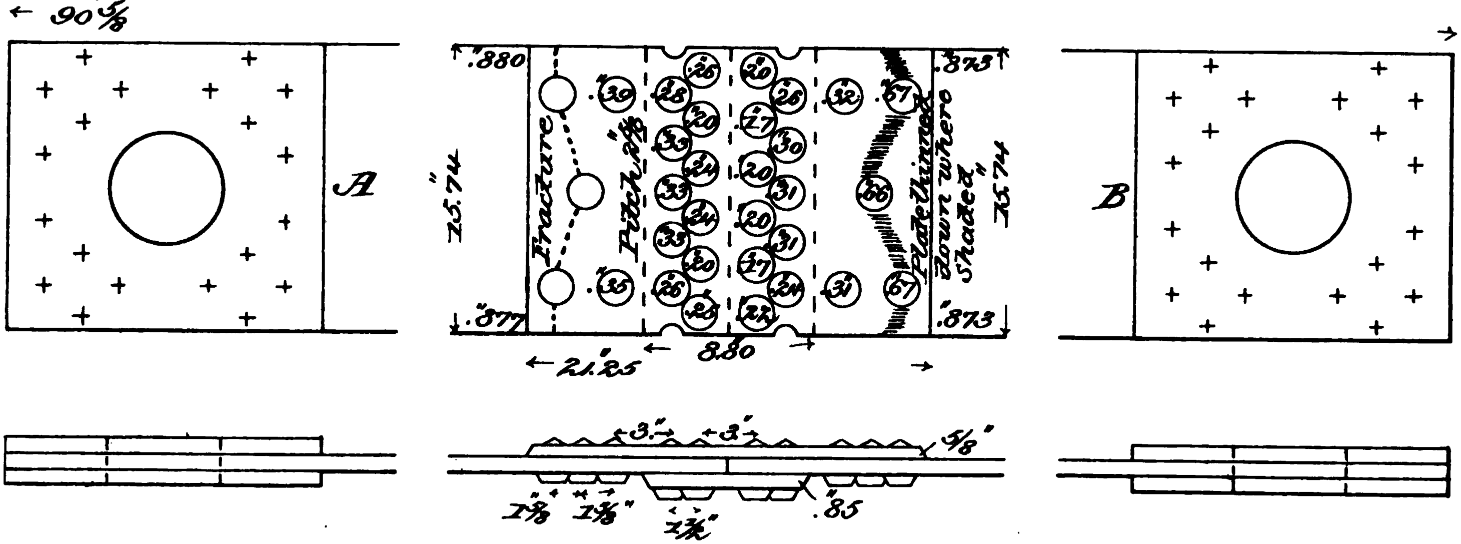
Fractured plate A along three outside rivet holes. Appearance of fracture, silky, lamellar. One seam in fractured surface $\frac{3}{4}$″ wide.

Maximum stress on joint.

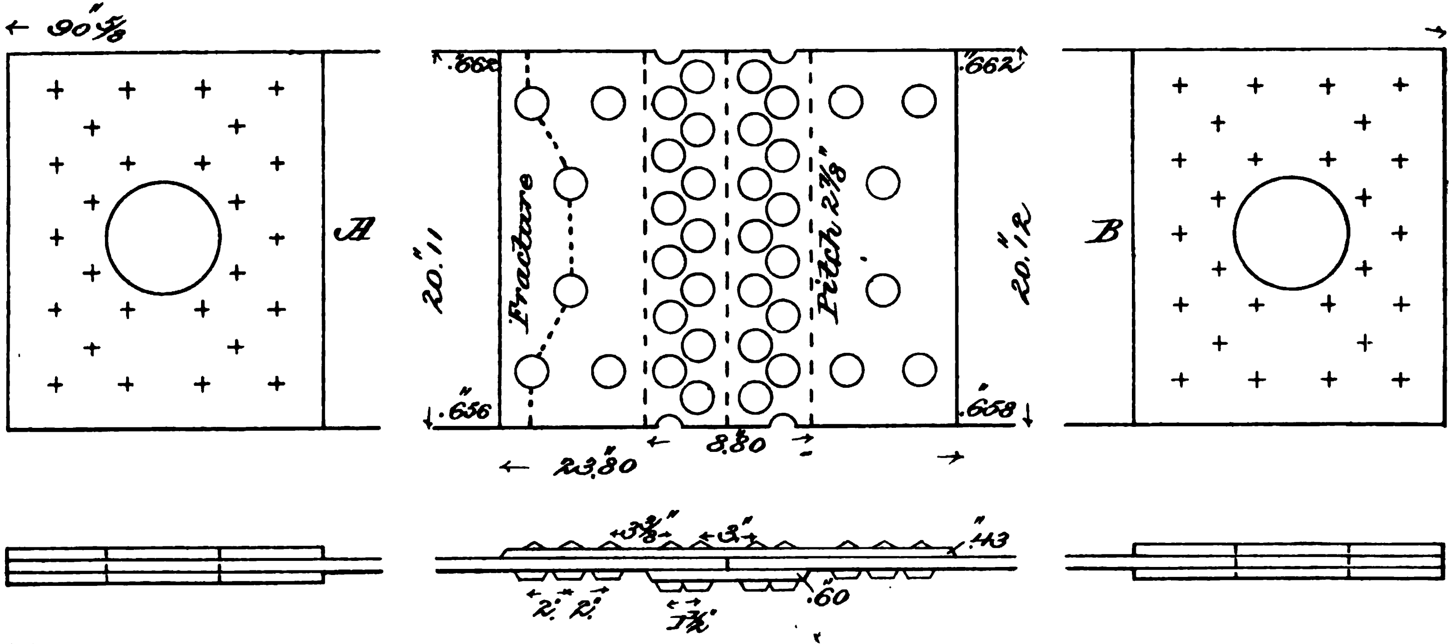
Tension on gross section of plate	pounds per square inch..	40.120
Tension on net section of plate	do........	50.578
Compression on bearing surface of rivets	do........	33.916
Shearing on rivets	do........	19.689

No. 924

Joint G3



No. 925 Joint M1



H Ex No 16 50, 1.

No. 925.

(3 plates, 1″ iron rivets, 1$\frac{1}{16}$″ drilled holes; 2 plates, 1$\frac{1}{8}$″ iron rivets, 1$\frac{1}{4}$″ drilled holes.)

Areas.

Plate A, gross sectional area	square inches..	13.252
Plate A, net sectional area	do......	10.537
Plate A, bearing surface of rivets	do......	14.045
Rivets, shearing area	do......	30.41

Gauged length, 25″.

Joint warped convex on the micrometer side.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
13,252	1,000	0.	0.	Initial load.
26,504	2,000	.0002	....	
39,756	3,000	.0014	....	
53,008	4,000	.0022	....	
66,260	5,000	.0030	.0016	
79,512	6,000	.0047	....	
92,764	7,000	.0055	....	
106,016	8,000	.0069	....	
119,268	9,000	.0086	....	
132,520	10,000	.0101	.0051	
145,772	11,000	.0127	....	
159,024	12,000	.0140	....	
172,276	13,000	.0168	....	
185,528	14,000	.0184	....	
198,780	15,000	.0210	.0118	
212,032	16,000	.0250	....	
225,284	17,000	.0275	....	
238,536	18,000	.0306	....	
251,788	19,000	.0345	....	
265,040	20,000	.0386	.0233	
278,292	21,000	.0425	....	
291,544	22,000	.0460	....	
304,796	23,000	.0500	....	
318,048	24,000	.0558	....	
331,300	25,000	.0680	.0467	
344,552	26,000	.0855	....	
357,804	27,000	.1186	....	
371,056	28,000	.1520	....	
384,308	29,000	.20	....	
397,560	30,000	.23	....	
410,812	31,000	.27	....	
424,064	32,000	.32	....	
437,316	33,000	.36	....	
450,568	34,000	.43	....	
463,820	35,000	.47	....	
477,072	36,000	.54	....	
490,324	37,000	.61	....	
503,576	38,000	.71	....	
516,828	39,000	.79	....	
530,080	40,000	.91	....	
543,332	41,000	1.02	....	
556,584	42,000	1.17	....	
567,500	42,820	....	....	Tensile strength.

Fractured plate A along outside rows of rivet holes. Appearance of fractures, silky, lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	42,820
Tension on net section of plate	do........	53,860
Compression on bearing surface of rivets	do........	40,410
Shearing on rivets	do........	18,660

No. 926.

(3 plates, 1″ iron rivets, $1\frac{1}{16}$″ drilled holes; 2 plates, $1\frac{1}{8}$″ iron rivets, $1\frac{1}{4}$″ drilled holes.)

Areas.

Plate B, gross sectional area	square inches..	12.776
Plate B, net sectional area	do......	10.134
Plate B, bearing surface of rivets	do......	13.548
Rivets shearing area	do......	[illegible].41

Gauged length, 25.″

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
12,776	1,000	0.	0.	Initial load.
25,552	2,000	.0001	....	
38,328	3,000	.0001	....	
51,104	4,000	.0009	....	
63,880	5,000	.0017	.0002	
76,656	6,000	.0030	....	
89,432	7,000	.0032	....	
102,208	8,000	.0042	....	
114,984	9,000	.0055	....	
127,760	10,000	.0075	.0022	
140,536	11,000	.0087	....	
153,312	12,000	.0108	....	
166,088	13,000	.0126	....	
178,864	14,000	.0140	....	
191,640	15,000	.0155	.0067	
204,416	16,000	.0178	....	
217,192	17,000	.0202	....	
229,968	18,000	.0225	....	
242,744	19,000	.0245	....	
255,520	20,000	.0278	.0140	
268,296	21,000	.0315	....	
281,072	22,000	.0342	....	
293,848	23,000	.0387	....	
306,624	24,000	.0424	....	
319,400	25,000	.0494	.0299	
332,176	26,000	.0564	....	
344,952	27,000	.0655	....	
357,728	28,000	.0765	....	
370,504	29,000	.0971	....	
383,280	30,000	.1248	....	
396,050	31,000	.1745	....	
408,832	32,000	.21	....	
421,608	33,000	.26	....	
434,384	34,000	.30	....	
447,160	35,000	.35	....	
459,936	36,000	.40	....	
472,712	37,000	.45	....	
485,488	38,000	.52	....	
498,264	39,000	.60	....	
511,040	40,000	.68	....	
523,816	41,000	.78	....	
536,592	42,000	.88	....	
549,368	43,000	.97	....	
562,144	44,000	1.11	....	
574,920	45,000	1.31	....	
578,800	45,300	....	....	Tensile strength.

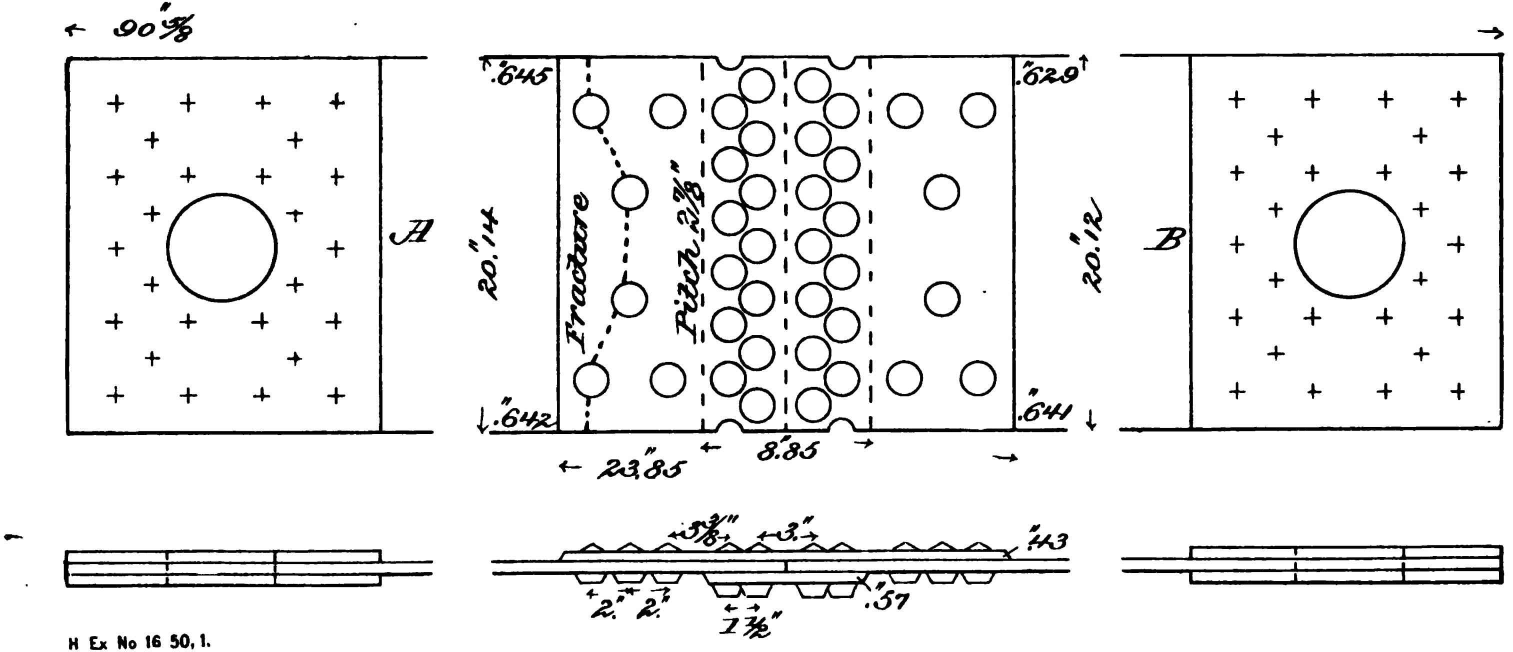
Fractured plate A along outside rows of rivet holes. Appearance of fractures, silky, slightly lamellar.

Maximum stress on joint.

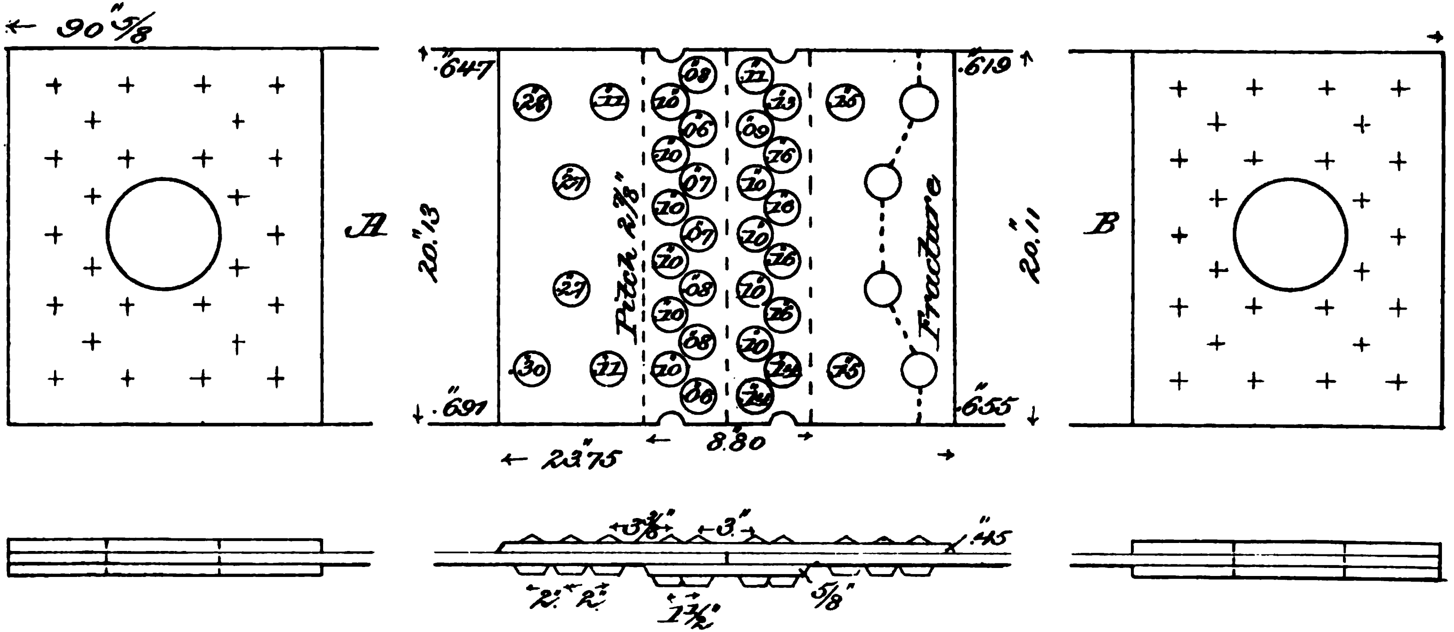
Tension on gross section of plate	pounds per square inch..	45,300
Tension on net section of plate	do........	57,[illegible]
Compression on bearing surface of rivets	do........	42,72[illegible]
Shearing on rivets	do........	1[illegible]

No. 926

Joint H2



No. 927 Joint 11.3



H Ex No 16 50, 1.

No. 927.

(3 plates, 1″ iron rivets, $1\frac{1}{16}$″ drilled holes; 2 plates, $1\frac{1}{8}$″ iron rivets, $1\frac{1}{4}$″ drilled holes.)

Areas.

Plate B, gross sectional area	square inches..	12.81
Plate B, net sectional area	do......	10.186
Plate B, bearing surface of rivets	do......	13.576
Rivets, shearing area	do......	30.41

Gauged length, 25″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
12,810	1,000	0.	0.	Initial load.
25,620	2,000	.0004	....	
38,430	3,000	.0008	....	
51,240	4,000	.0013	....	
64,050	5,000	.0023	.0007	
76,860	6,000	.0029	....	
89,670	7,000	.0038	....	
102,480	8,000	.0046	....	
115,290	9,000	.0059	....	
128,100	10,000	.0076	.0030	
140,910	11,000	.0086	....	
153,720	12,000	.0098	....	
166,530	13,000	.0115	....	
179,340	14,000	.0130	....	
192,150	15,000	.0151	.0067	
204,960	16,000	.0180	....	
217,770	17,000	.0201	....	
230,580	18,000	.0219	....	
243,390	19,000	.0253	....	
256,200	20,000	.0285	.0152	
269,010	21,000	.0325	....	
281,820	22,000	.0348	....	
294,630	23,000	.0388	....	
307,440	24,000	.0440	....	
320,250	25,000	.0488	.0310	
333,060	26,000	.0563	....	
345,870	27,000	.0645	....	
358,680	28,000	.0749	....	
371,490	29,000	.0935	....	
384,300	30,000	.1370	....	
397,100	31,000	.16	....	
409,920	32,000	.22	....	
422,730	33,000	.26	....	
435,540	34,000	.31	....	
448,350	35,000	.34	....	
461,160	36,000	.40	....	
473,970	37,000	.46	....	
486,780	38,000	.52	....	
499,590	39,000	.60	....	
512,400	40,000	.67	....	
525,210	41,000	.77	....	
538,020	42,000	.86	....	
550,830	43,000	.98	....	
563,640	44,000	1.10	....	
576,450	45,000	1.28	....	
590,260	46,070	....	....	Tensile strength.

Fractured plate B along outside rows of rivet holes. Appearance of fractures, silky; slightly lamellar. Plates open at butt joint $\frac{1}{2}$″.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	46,070
Tension on net section of plate	do........	57,940
Compression on bearing surface of rivets	do........	43,470
Shearing on rivets	do........	19,410

No. 928.

($\frac{15}{16}$″ iron rivets; 1″ drilled holes.)

Areas.

Plate B, gross sectional area	square inches	8.287
Plate B, net sectional area	do	6.839
Plate B, bearing surface of rivets	do	8.057
Rivets, shearing area	do	18.06

Gauged length, 25″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
8,287	1,000	0.	0.	Initial load.
16,574	2,000	.0005	....	
24,861	3,000	.0017	....	
33,148	4,000	.0037	....	
41,435	5,000	.0060	.0044	
49,722	6,000	.0078	....	
58,009	7,000	.0095	....	
66,296	8,000	.0115	....	
74,583	9,000	.0140	....	
82,870	10,000	.0162	.0096	
91,157	11,000	.0185	....	
99,444	12,000	.0199	....	
107,731	13,000	.0220	....	
116,018	14,000	.0240	....	
124,305	15,000	.0258	.0147	
132,592	16,000	.0291	....	
140,879	17,000	.0308	....	
149,166	18,000	.0326	....	
157,453	19,000	.0346	....	
165,740	20,000	.0378	.0198	
174,027	21,000	.0405	....	
182,314	22,000	.0438	....	
190,601	23,000	.0458	....	
198,888	24,000	.0503	....	
207,175	25,000	.0552	.0311	
215,462	26,000	.0619	....	Scale started off plate B.
223,749	27,000	.0770	....	
232,036	28,000	.1375	....	
240,323	29,000	.19	....	
248,610	30,000	.24	....	
256,897	31,000	.29	....	
265,184	32,000	.33	....	
273,471	33,000	.38	....	
281,758	34,000	.44	....	
290,045	35,000	.49	....	
298,332	36,000	.56	....	
306,619	37,000	.65	....	
314,906	38,000	.73	....	
323,193	39,000	.82	....	
331,480	40,000	.96	....	
350,150	42,250	....	....	Tensile strength.

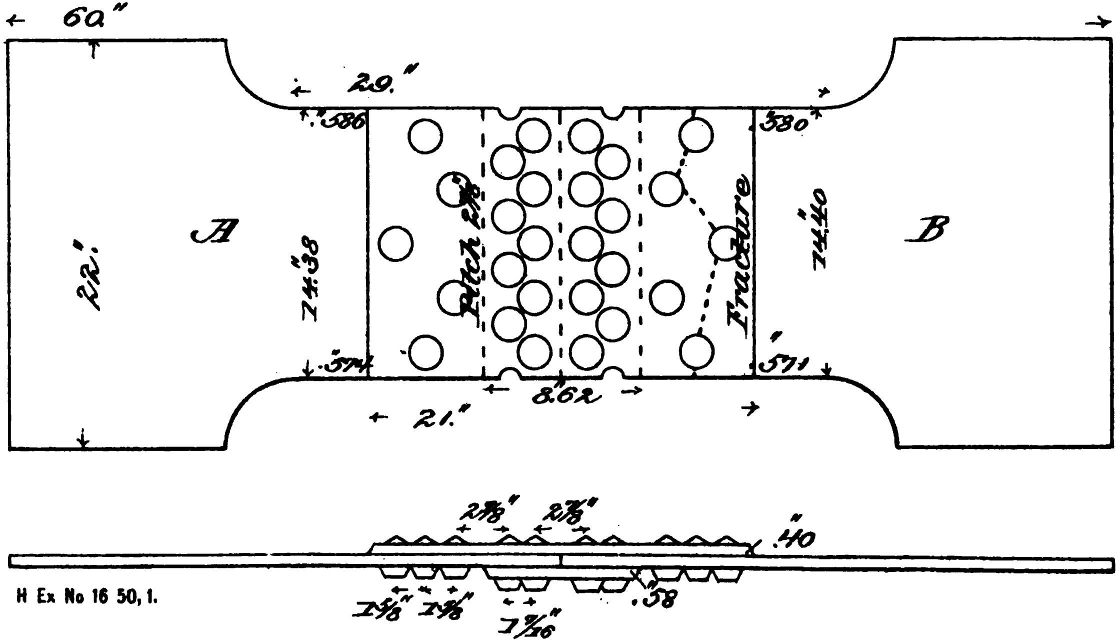
Fractured plate B along outside rows of rivets, beginning the fractures at edges and extending from rivet holes towards the middle of the plate.

Appearance of fractures, silky, slightly lamellar; metal well drawn down.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch	42,250
Tension on net section of plate	do	51,199
Compression on bearing surface of rivets	do	43,459
Shearing on rivets	do	19,388

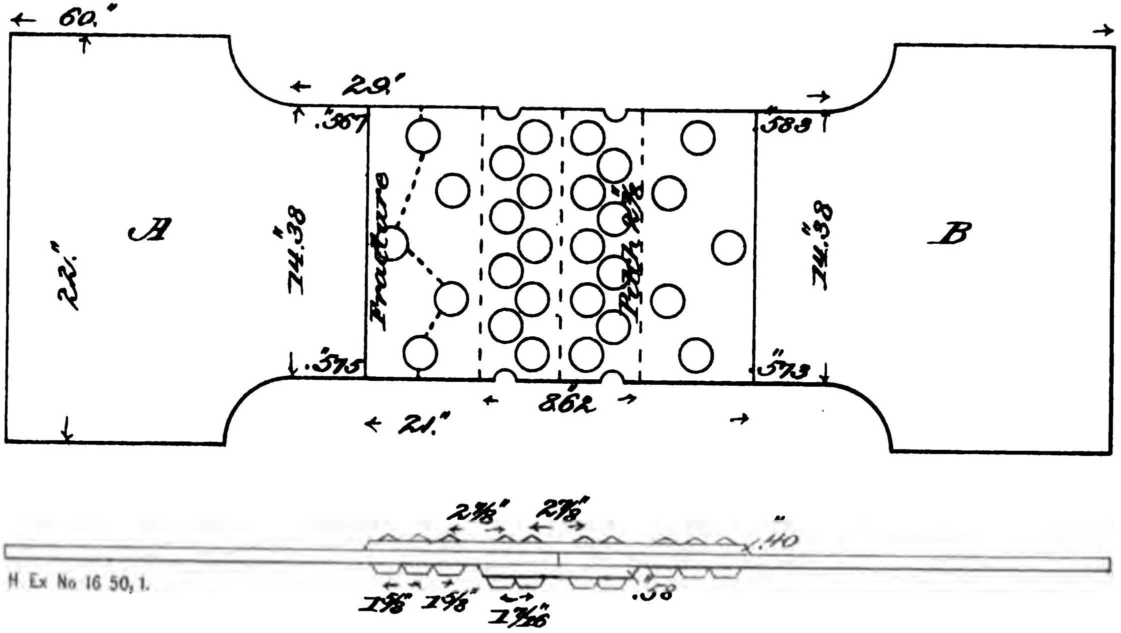
No. 928 Joint I1



H Ex No 16 50, 1.

No. 929

Joint 12



No. 929.

($\frac{15}{16}$″ iron rivets; 1″ drilled holes.)

Areas.

Plate A, gross sectional area	square inches..	8.211
Plate A, net sectional area	do......	6.755
Plate A, bearing surface of rivets	do......	7.994
Rivets, shearing area	do......	18.06

Gauged length, 25″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
8,211	1,000	0.	0.	Initial load.
16,422	2,000	.0005	....	
24,633	3,000	.0011	....	
32,844	4,000	.0018	....	
41,055	5,000	.0030	.0017	
49,266	6,000	.0045	....	
57,477	7,000	.0065	....	
65,688	8,000	.0094	....	
73,899	9,000	.0118	....	
82,110	10,000	.0140	.0092	
90,321	11,000	.0174	....	
98,532	12,000	.0194	....	
106,743	13,000	.0220	....	
114,954	14,000	.0245	....	
123,165	15,000	.0268	.0168	
131,376	16,000	.0295	....	
139,587	17,000	.0319	....	
147,798	18,000	.0342	....	
156,009	19,000	.0368	....	
164,220	20,000	.0394	.0287	
172,431	21,000	.0431	....	
180,642	22,000	.0455	....	
188,853	23,000	.0495	....	
197,064	24,000	.0538	....	
205,275	25,000	.0583	.0362	
213,486	26,000	.0688	....	Scale starts off plates.
221,697	27,000	.1010	....	
229,908	28,000	.1540	....	
238,119	29,000	.19	....	
246,330	30,000	.25	....	
254,541	31,000	.28	....	
262,752	32,000	.33	....	
270,963	33,000	.39	....	
279,174	34,000	.44	....	
287,385	35,000	.51	....	
295,596	36,000	.59	....	
303,807	37,000	.68	....	
312,018	38,000	.77	....	
320,229	39,000	.91	....	
328,440	40,000	1.06	....	
335,000	40,800	1.35	....	Tensile strength.

Fractured plate A along outside row of rivets. Appearance, silky, slight lamination.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	40,800
Tension on net section of plate	do........	49,590
Compression on bearing surface of rivets	do........	41,910
Shearing on rivets	do........	18,550

No. 930.

($\frac{15}{16}$″ iron rivets; 1″ drilled holes.)

Areas.

Plate A, gross sectional area	square inches	8.28
Plate A, net sectional area	do	6.81
Plate A, bearing surface of rivets	do	8.06
Rivets, shearing area	do	18.05

Gauged length, 25″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
4,140	500	0.	0.	Initial load.
8,280	1,000	.0002		
16,560	2,000	.0005		
24,840	3,000	.0012		
33,120	4,000	.0025		
41,400	5,000	.0042	.0028	
49,680	6,000	.0063		
57,960	7,000	.0091		
66,240	8,000	.0108		
74,520	9,000	.0128		
82,800	10,000	.0148	.0091	
91,080	11,000	.0180		
99,360	12,000	.0209		
107,640	13,000	.0232		
115,920	14,000	.0254		
124,200	15,000	.0280	.0164	
132,480	16,000	.0308		
140,760	17,000	.0328		
149,040	18,000	.0352		
157,320	19,000	.0383		
165,600	20,000	.0405	.0294	
173,880	21,000	.0451		
182,160	22,000	.0484		
190,440	23,000	.0530		
198,720	24,000	.0580		
207,000	25,000	.0655	.0417	
215,280	26,000	.0975		Scale starts off the plate.
223,560	27,000	.16		
231,840	28,000	.22		
240,120	29,000	.27		
248,400	30,000	.31		
256,680	31,000	.36		
264,960	32,000	.41		
273,240	33,000	.46		
281,520	34,000	.54		
289,800	35,000	.61		
298,080	36,000	.70		
306,360	37,000	.80		
314,640	38,000	.91		
322,920	39,000	1.06		
337,200	40,720			Tensile strength.

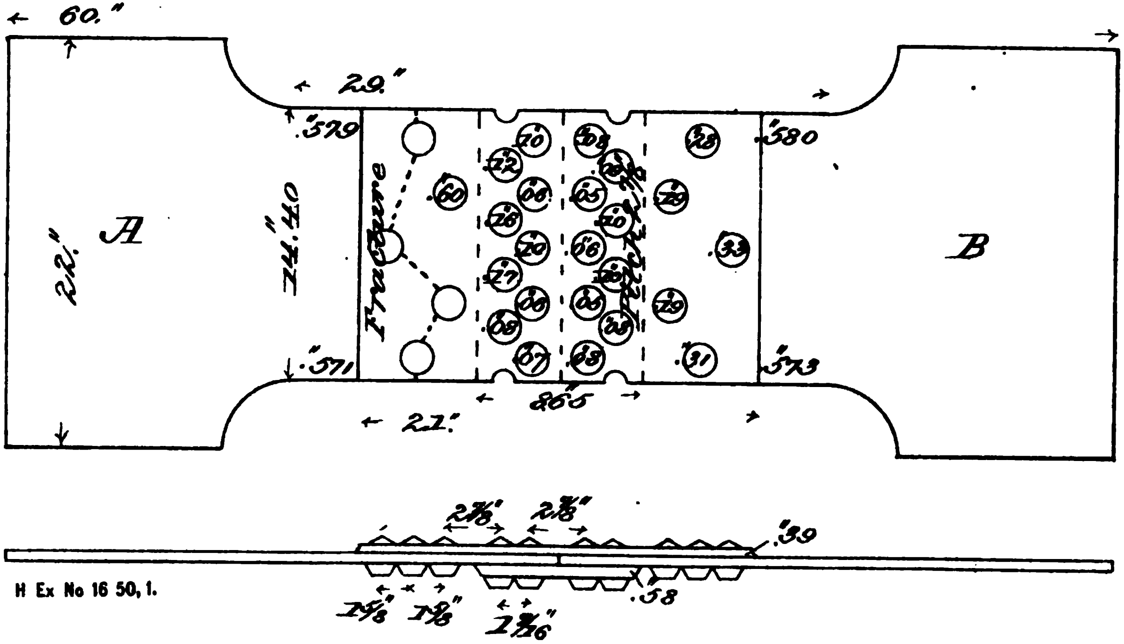
Fractures, silky, slightly lamellar. Metal well drawn down. Fracture began at outside rivet holes in plate A.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch	40,720
Tension on net section of plate	do	49,5[illegible]
Compression on bearing surface of rivets	do	41,8[illegible]
Shearing on rivets	do	18,6[illegible]

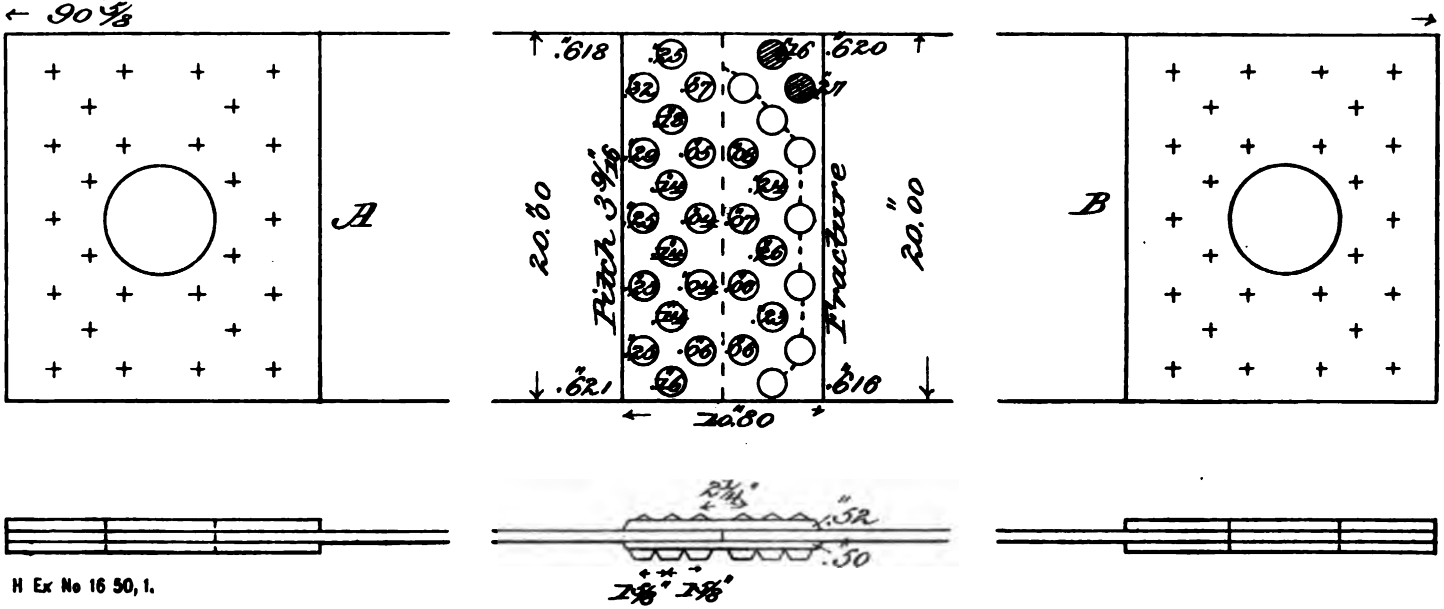
No. 930

Joint I3



H Ex No 16 50, 1.

No. 931 Joint K2



No. 931.

($\frac{3}{4}''$ iron rivets; $\frac{25}{32}''$ drilled holes.)

Areas.

Plate B, gross sectional area	square inches	12.36
Plate B, net sectional area	do	9.94
Plate B, bearing surface of rivets	do	7.73
Rivets, shearing area	do	15.34

Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
12,360	1,000	0.	0.	Initial load.
24,720	2,000	.0001	....	
37,080	3,000	.0003	....	
49,440	4,000	.0004	....	
61,800	5,000	.0006	0.	
74,160	6,000	.0010	....	
86,520	7,000	.0016	....	
98,880	8,000	.0019	....	
111,240	9,000	.0023	....	
123,600	10,000	.0026	.0004	
135,960	11,000	.0031	....	
148,320	12,000	.0041	....	
160,680	13,000	.0048	....	
173,040	14,000	.0056	....	
185,400	15,000	.0069	.0025	
197,760	16,000	.0081	....	
210,120	17,000	.0103	....	
222,480	18,000	.0135	....	
234,840	19,000	.0145	....	
247,200	20,000	.0170	.0101	
259,560	21,000	.0187	....	
271,920	22,000	.0202	....	
284,280	23,000	.0220	....	
296,640	24,000	.0251	....	
309,000	25,000	.0289	.0190	
321,360	26,000	.0348	....	
333,720	27,000	.0465	....	
346,080	28,000	.0590	....	
358,440	29,000	.0780	....	
370,800	30,000	.1045	....	
383,160	31,000	.1385	....	
395,520	32,000	.17	....	
407,880	33,000	.20	....	
420,240	34,000	.24	....	
432,600	35,000	.27	....	
444,960	36,000	.30	....	
457,320	37,000	.35	....	
469,680	38,000	.39	....	
482,040	39,000	.43	....	
494,400	40,000	.49	....	
506,760	41,000	.55	....	
519,120	42,000	.62	....	
531,480	43,000	.73	....	
538,900	43,600	....	....	Tensile strength.

Fractured plate B. Followed outside row of rivet holes in part and thence through inside rows to the end of the plate. Sheared two end rivets. Appearance of fractures, silky; slightly lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch	43.600
Tension on net section of plate	do	54.220
Compression on bearing surface of rivets	do	69.720
Shearing on rivets	do	35.130

No. 932.

($\frac{3}{4}''$ iron rivets; $\frac{13}{32}''$ drilled holes.)

Areas.

Plate A, gross sectional area	square inches..	12.93
Plate A, net sectional area	do......	10.40
Plate A, bearing surface of rivets	do......	8.08
Rivets, shearing area	do......	15.34

Gauged length, 15″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
12,930	1,000	0.	0.	Initial load.
25,860	2,000	.0002	....	
38,790	3,000	.0004	....	
51,720	4,000	.0006	....	
64,650	5,000	.0010	.0001	
77,580	6,000	.0010	....	
90,510	7,000	.0014	....	
103,440	8,000	.0019	....	
116,370	9,000	.0020	....	
129,300	10,000	.0024	.0005	
142,230	11,000	.0032	....	
155,160	12,000	.0035	....	
168,090	13,000	.0042	....	
181,020	14,000	.0054	....	
193,950	15,000	.0064	.0039	
206,880	16,000	.0085	....	
219,810	17,000	.0109	....	
232,740	18,000	.0125	....	
245,670	19,000	.0138	....	
258,600	20,000	.0156	.0098	
271,530	21,000	.0178	....	
284,460	22,000	.0203	....	
297,390	23,000	.0230	....	
310,320	24,000	.0275	....	
323,250	25,000	.0332	.0239	
336,180	26,000	.0440	....	
349,110	27,000	.0556	....	
362,040	28,000	.0750	....	
374,970	29,000	.0997	....	
387,900	30,000	.1325	....	
400,830	31,000	.16	....	
413,760	32,000	.20	....	
426,690	33,000	.24	....	
439,620	34,000	.27	....	
452,550	35,000	.31	....	
465,480	36,000	.34	....	
478,410	37,000	.39	....	
491,340	38,000	.44	....	
504,270	39,000	.52	....	
517,200	40,000	.58	....	
530,130	41,000	.67	....	
543,060	42,000	.77	....	
555,990	43,000	.95	....	
559,300	43,260	....	....	Tensile strength.

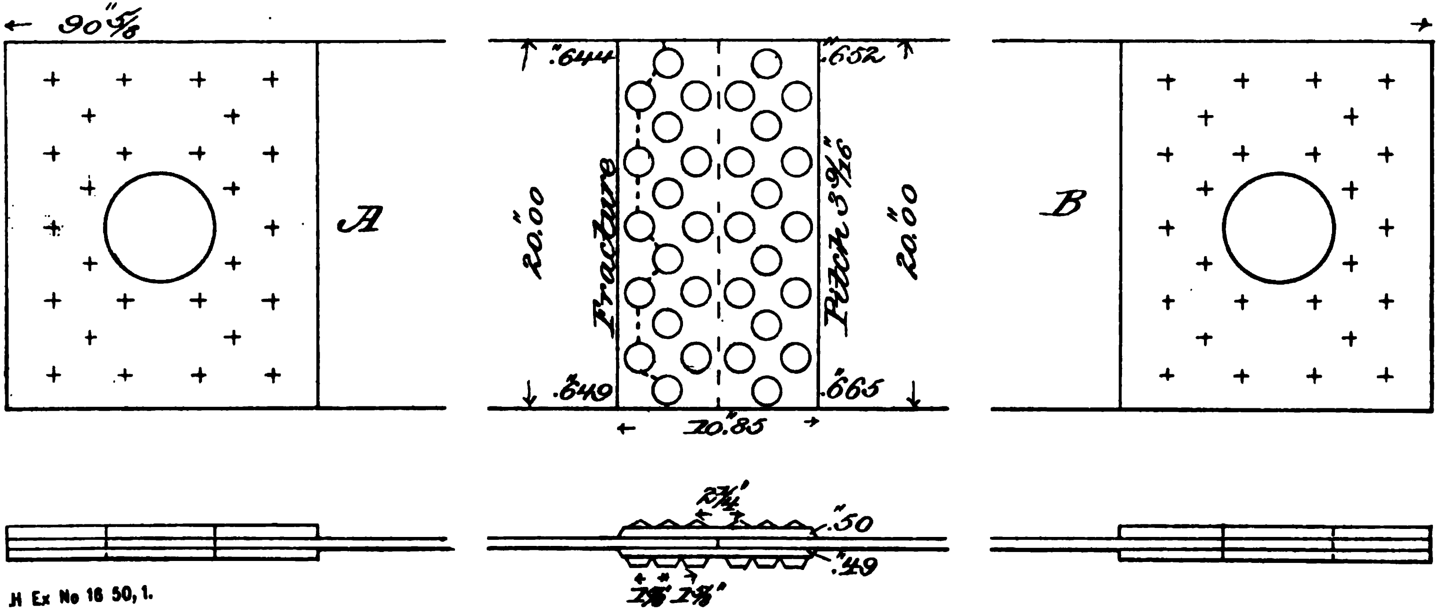
Fractured plate A along outside row of rivet holes, except end sections and one middle section. Appearance of fractures, silky, lamellar.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	43, [illegible]
Tension on net section of plate	do........	53, 7[illegible]
Compression on bearing surface of rivets	do........	69, 2[illegible]
Shearing on rivets	do........	36, 4[illegible]

No. 932

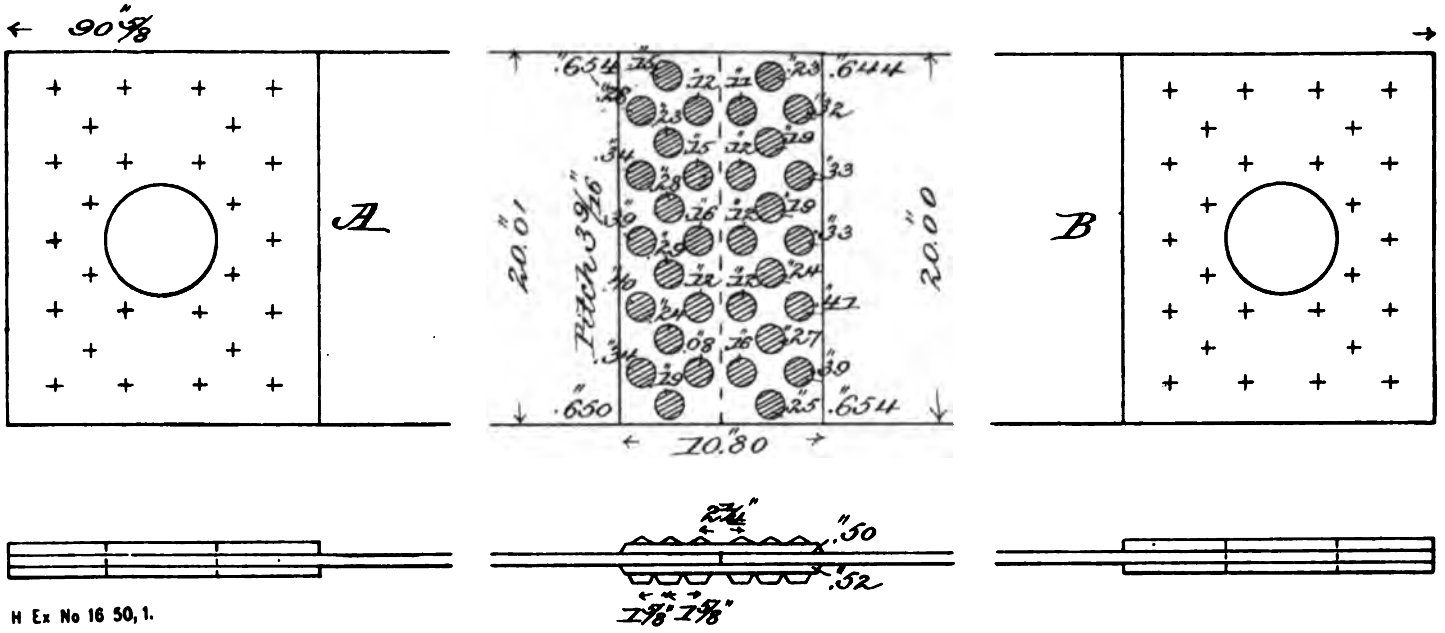
Joint K2



H Ex No 16 50, 1.

No. 933

Joint K3



H Ex No 16 50, 1.

No. 933.

($\frac{3}{4}''$ iron rivets; $\frac{25}{32}''$ drilled holes.)

Areas.

Plate B, gross sectional area	square inches..	12.98
Plate B, net sectional area	do......	10.44
Plate B, bearing surface of rivets	do......	8.11
Rivets, shearing area	do......	15.34

Gauged length, 15″.

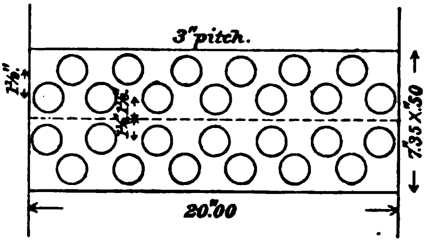
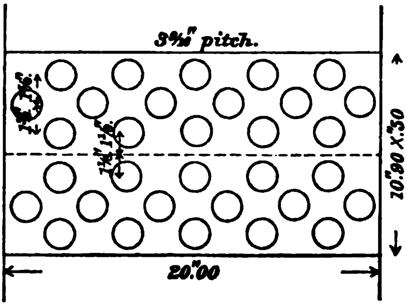
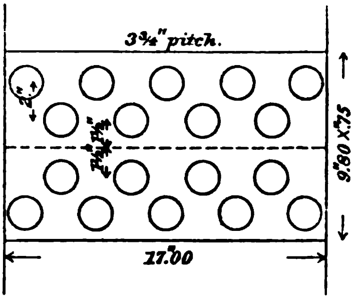
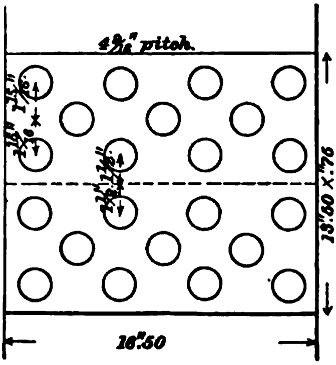
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
12,980	1,000	0.	0.	Initial load.
25,960	2,000	.0001	....	
38,940	3,000	.0009	....	
51,920	4,000	.0013	....	
64,900	5,000	.0015	.0005	
77,880	6,000	.0014	....	
90,860	7,000	.0019	....	
103,840	8,000	.0020	....	
116,820	9,000	.0025	....	
129,800	10,000	.0030	.0005	
142,780	11,000	.0035	....	
155,760	12,000	.0039	....	
168,740	13,000	.0045	....	
181,720	14,000	.0054	....	
194,700	15,000	.0072	.0028	
207,680	16,000	.0085	....	
220,660	17,000	.0130	....	
233,640	18,000	.0141	....	
246,620	19,000	.0155	....	
259,600	20,000	.0178	.0107	
272,580	21,000	.0195	....	
285,560	22,000	.0223	....	
298,540	23,000	.0255	....	
311,520	24,000	.0328	....	
324,500	25,000	.0442	.0340	
337,480	26,000	.0605	....	
350,460	27,000	.0760	....	
363,440	28,000	.0955	....	
376,420	29,000	.1250	....	
389,400	30,000	.16	....	
402,380	31,000	.21	....	
415,360	32,000	.25	....	
428,340	33,000	.28	....	
441,320	34,000	.32	....	
454,300	35,000	.36	....	
467,280	36,000	.40	....	
480,260	37,000	.45	....	
493,240	38,000	.50	....	
506,220	39,000	.55	....	
519,200	40,000	.63	....	
532,180	41,000	.71	....	
545,160	42,000	.82	....	
558,140	43,000	.93	....	Tensile strength.

Sheared every rivet in the joint in both plates. The under cover dropped to the floor. Double shear in plate A three rivets; single shear in plate B with the exception of one rivet, which sheared in two planes.

Maximum stress on joint.

Tension on gross section of plate	pounds per square inch..	43,000
Tension on net section of plate	do........	53,460
Compression on bearing surface of rivets	do........	68,820
Shearing on rivets	do........	36,390

TABULATION OF RIVETED JOINTS FOR UNITED STATES

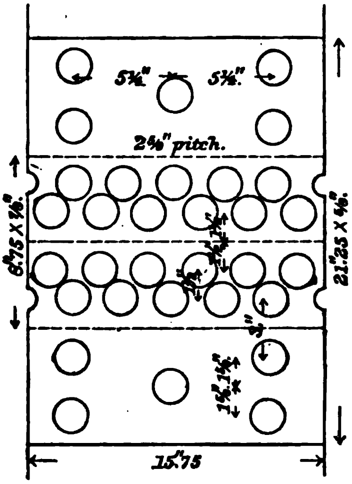
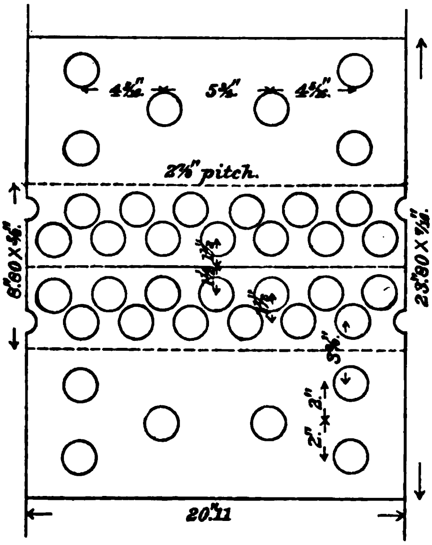
No. of test.	Marks.	Style of joint.	Nominal thickness of plate.	Size and kind of rivets and holes.
			Inch.	
910	A₁		⅜	
911	A₂		⅜	¾-inch steel rivets, 13/16-inch drilled holes.
912	A₃		⅜	
913	B₁		⅜	
914	B₂		⅜	⅞-inch steel rivets, 15/16-inch drilled holes.
915	B₃		⅜	
916	D₁		⅝	
917	D₂		⅝	1-inch steel rivets, 1 1/16-inch drilled holes.
918	D₃		⅝	
919	E₁		⅝	
920	E₂		⅝	1-inch steel rivets, 1 1/16-inch drilled holes.
921	E₃		⅝	

NAVY DEPARTMENT, BUREAU OF STEAM ENGINEERING.

Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq.inches.	*Sq.inches.*	*Sq.inches.*	*Sq.inches.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
13.22	10.12	6.72	12.46	53,710	42,860	55,990	84,320	**45,470**	79.8
13.08	10.01	6.64	12.46	53,710	40,960	**53,530**	80,690	43,000	76.2
12.41	9.50	6.30	12.46	53,710	42,720	**55,800**	84,140	**42,540**	79.5
12.81	10.31	8.01	15.34	53,710	43,460	**54,040**	69,560	36,320	80.9
12.69	10.21	7.93	15.34	53,710	40,390	**50,200**	64,630	33,410	75.2
12.691	10.21	7.94	15.34	53,710	44,290	**55,050**	70,790	36,640	82.5
14.671	10.09	8.25	15.96	51,190	35,180	**51,150**	62,560	32,340	68.7
14.646	10.07	8.23	15.96	51,190	36,190	**52,640**	64,410	33,210	70.7
14.705	10.11	8.27	15.96	51,190	35,780	**52,050**	63,630	32,970	69.9
14.322	10.63	10.15	19.51	51,190	37,910	**51,080**	53,500	27,830	74.1
14.438	10.72	10.23	19.51	51,190	38,400	**51,720**	54,190	28,420	75.0
14.256	10.58	10.10	19.51	51,190	37,950	**51,130**	53,560	27,780	74.1

[The figures in heavy-faced type indicate the manner of failure.]

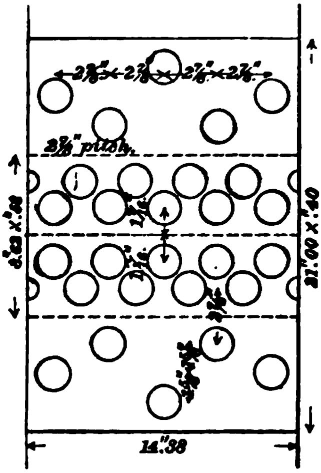
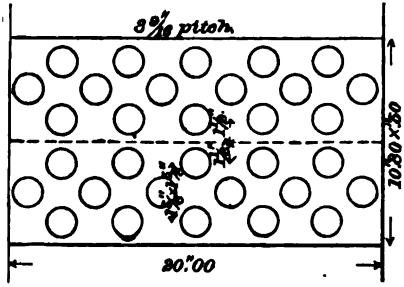
TABULATION OF RIVETED JOINTS FOR UNITED STATES NAVY

No. of test.	Marks.	Style of joint.	Nominal thickness of plate.	Size and kind of rivets and holes.
			Inch.	
922	G₁	 5¼″ 5¼″ 2⅝″ pitch. 8.75 × ½″ 21.25 × ½″ 1½″ 1⅝″ 3″ 1½″ 1⅝″ 15.75	½	3 plates. 1$\frac{1}{16}$-inch iron rivets. 1⅛-inch drilled holes.
923	G₂		½	2 plates. 1⅛-inch iron rivets. 1¼-inch drilled holes.
924	G₃		½	
925	H₁	 4½″ 5¼″ 4½″ 2⅝″ pitch. 8.80 × ⅜″ 23.80 × ⅜″ 1½″ 1⅝″ 3⅝″ 2″ 2″ 20.11	⅜	3 plates. 1-inch iron rivets. 1$\frac{1}{16}$-inch drilled holes.
926	H₂		⅜	2 plates. 1⅛-inch iron rivets. 1¼-inch drilled holes.
927	H₃		⅜	

DEPARTMENT, BUREAU OF STEAM ENGINEERING—Continued.

Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inches.	*Sq. inches.*	*Sq. inches.*	*Sq. inches.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
13.781	10.93	16.30	28.00	51,190	40,810	**51,460**	34,500	20,090	79.7
13.852	10.965	16.38	28.00	51,190	41,740	**52,640**	35,300	20,650	81.5
13.741	10.90	16.26	28.00	51,190	40,120	**50,580**	33,910	19,690	78.4
13.252	10.537	14.045	30.41	53,710	42,820	**53,860**	40,410	18,660	79.7
12.776	10.154	13.548	30.41	53,710	45,300	**57,000**	42,720	19,030	84.3
12.81	10.186	13.576	30.41	53,710	46,070	**57,940**	43,470	19,410	85.8

TABULATION OF RIVETED JOINTS FOR UNITED STATES NAVY

No. of test.	Marks.	Style of joint.	Nominal thickness of plate.	Size and kind of rivets and holes.
			Inch.	
928	I₁		9/16	
929	I₂	 2⅞″ 2⅞″ 2⅞″ 2⅞″ 2⅞″ pitch. 3.83 × .38 21.00 × .40 14.38	9/16	15/16-inch iron rivets, 1-inch drilled holes.
930	I₃		9/16	
931	K₁		⅝	
932	K₂		⅝	¾-inch iron rivets, 13/16-inch drilled holes.
933	K₃		⅝	

DEPARTMENT, BUREAU OF STEAM ENGINEERING—Continued.

Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inches.	*Sq. inches.*	*Sq. inches.*	*Sq. inches.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
8.287	6.820	8.057	18.06	....	42,250	**51,330**	43,450	19,880	....
8.211	6.755	7.994	18.06	....	40,800	**49,590**	41,910	18,550	....
8.28	6.81	8.05	18.06	....	40,720	**49,520**	41,890	18,670	....
12.36	9.94	7.78	15.84	53,710	43,600	**54,220**	69,720	**35,130**	81.2
12.93	10.40	8.08	15.84	53,710	43,260	**53,780**	69,220	36,460	80.5
12.98	10.44	8.11	15.84	53,710	43,000	53,460	68,820	**36,390**	80.1

TENSION TESTS OF STRIPS CUT FROM FRACTURED ENDS OF RIVETED JOINTS.

These strips were taken from the middle of the width of the joint plates and parallel to the direction the joints were pulled.

Two strips were taken from each, one strip annealed by heating bright red and cooling in the open air; the duplicates were not annealed, and were tested as taken from the fractured joint.

When the annealed specimens were at the maximum temperature, center-punch marks, 10 inches apart, were stamped on one edge, and about the time the color had left them they were marked again on the other edge. After cooling to 70° Fahr. the distances between these marks were measured.

The amount of contraction, therefore, indicates approximately the heat at which the strips were annealed.

TENSILE TESTS OF STRIPS CUT FROM FRACTURED ENDS OF RIVETED JOINTS.

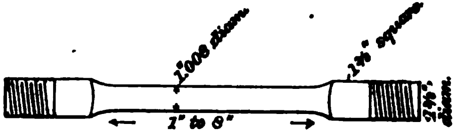
Joint test number.	Marks.	Contraction in 10 inches from—		Dimensions.		Sectional area.	Elastic limit (approximate).		Tensile strength.		Load at time of fracture.	
		Bright red.	Black heat.	Width.	Thickness.		Total.	Per square inch.	Total.	Per square inch.	Total.	Per square inch.
		Inch.	*Inch.*	*Inches.*	*Inch.*	*Square inches.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
911	A_2	.104	.081	1.460	.647	.944	31,800	33,690	51,880	54,960	45,800	96,020
		Not annealed.		1.486	.647	.961	34,800	36,210	55,600	57,860	44,900	97,610
913	B_1	.111	.084	1.448	.630	.912	30,600	33,550	52,220	57,260	45,000	97,400
		Not annealed.		1.510	.628	.948	38,000	40,080	56,400	59,490	45,500	89,220
916	D_1	.108	.086	1.440	.844	1.215	37,400	30,780	62,750	51,650	48,000	103,000
		Not annealed.		1.472	.845	1.244	39,500	31,750	66,600	53,540	50,500	95,280
919	E_1	.121	.078	1.473	.850	1.252	41,000	32,750	69,330	55,370	55,500	102,780
		Not annealed.		1.457	.850	1.238	42,500	34,330	70,600	57,030	59,000	91,610
922	G_1	.126	.079	1.460	.847	1.237	40,300	32,580	68,350	51,210	46,000	106,480
		Not annealed.		1.393	.840	1.170	Not well defined.		62,550	53,460	47,800	95,800
925	H_1	.117	.080	1.474	.615	.907	32,700	36,050	52,080	57,420	43,000	101,900
		Not annealed.		1.497	.611	.915	35,000	38,250	54,250	59,290	44,500	98,020
931	K_1	.108	.076*	1.450	.610	.885	31,100	35,140	51,040	57,670	41,200	101,970
		Not annealed.		1.408	.605	.852	32,500	38,150	50,800	59,630	41,000	96,790

* ".090 contraction from dark red.

Joint test number.	Marks.	Condition.	Elongation in 10 inches.		Area of fracture.	Contraction of area.	Appearance of fracture.	Elongation of inch sections.
			Inches.	*Per cent.*	*Inches. Sq. in.*	*Per cent.*		
911	A_2	Annealed	2.52	25.2	1.06×.45=.477	49.5	Silky, lamellar	".62*, ".23, ".21, "21, ".22, ".21, "21, ".23, ".21, ".17.
		Not annealed	1.13	11.3	1.07×.43=.460	52.1	.....do	.37, .17, .12, .09, .08, .06, .07, .05, .06, .06.
913	B_1	Annealed	2.40	24.0	1.05×.44=.462	49.3	Silky, stratified	.15, .14, .14, .17, .19, .24, .50*, .46*, .23, .18.
		Not annealed	1.33	13.3	1.16×.44=.510	46.2	......do	.67*, .20, .11, .08, .06, .05, .04, .05, .03, .04.
916	D_1	Annealed	2.84	28.4	.95×.49=.466	61.6	Silky, slightly lamellar	.21, .21. .20, .25, .43, .73*, .27, .22, .16, .16.
		Not annealed	.82	8.2	1.04×.51=.530	57.4	Silky	.06, .03, .04, .05, .05, .05, .09, .07, .14, .24.
919	E_1	Annealed	2.97	29.7	1.00×.54=.540	56.9	Silky, slightly lamellar	.19, .17, .21, .25, .30. .33, .79*, .29, .25, .19.
		Not annealed	.67	6.7	1.11×.58=.644	48.0	Silky	.04, .04, .02, .03, .05, .05, .05, .09, .11, .19.
922	G_1	Annealed	3.16	31.6	.90×.48=.432	65.1	.....do	.16, .16, .19, .22, .28, .31. .32, .90*, .34, .28.
		Not annealed	.65	6.5	.96×.52=.499	57.4	......do	.29, .09, .08, .06, .04, .03. .02, .02, .01, .01.
925	H_1	Annealed	2.53	25.3	1.03×.41=.422	53.5	Silky, lamellar	.23, .27, .68*, .34. .24, .18, .16, .16, .12, .15.
		Not annealed	.87	8.7	1.08×.42=.454	50.4	Silky, slightly lamellar	.36, .15, .12, .09, .05, .03, .02, .03, .01, .01.
931	K_1	Annealed	2.32	23.2	1.01×.40=.404	54.4	......do	.71*, .27, .20, .20, .20, .17, .17, .16, .13, .11.
		Not annealed	1.42	14.2	1.02×.42=.428	49.7	Silky, stratified	.04, .03, .04, .06, .03, .07, .11, .32, .54*, .18.

TEST OF WROUGHT-IRON SPECIMENS TO SHOW EFFECT OF SLOW AND RAPID FRACTURES.

Form of specimens.



Sixteen specimens taken from the same bar of iron 1⅜″ square.
Specimens marked from A to P, consecutively, as cut from the bar.

Test number.	Marks.	Length.	Diameter of stem.	Sectional area.	Elastic limit, approximate.		Ultimate strength.		Duration of test.	Appearance of fracture.
					Total.	Per square inch.	Total.	Per square inch.		
		Inches.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*		
1009	A	Grooved..	1.008	.80	....	....	45,760	57,200	6 minutes...	Fibrous, 95 per cent.; granular, 5 per cent.
1010	B	Grooved..	1.008	.80	....	....	47,400	59,250	6 seconds...	Fibrous; small granular spot.
1011	C	.80	1.008	.80	21,900	27,375	39,500	49,380	6 minutes...	Fibrous.
1012	D	.80	1.008	.80	....	....	40,600	50,750	8 seconds...	Fibrous, stratified.
1013	E	1.60	1.008	.80	22,800	28,500	38,180	47,730	10 minutes..	Fibrous.
1014	F	1.60	1.008	.80	....	....	39,300	49,130	13 seconds..	Do.
1015	G	2.40	1.008	.80	24,100	30,125	38,380	47,980	8 minutes...	Do.
1016	H	2.40	1.008	.80	....	....	39,200	49,000	14 seconds..	Do.
1017	I	3.20	1.008	.80	23,700	29,625	37,660	47,070	10 minutes..	Do.
1018	J	3.20	1.008	.80	....	....	38,500	48,120	15 seconds..	Do.
1019	K	4.80	1.008	.80	23,900	29 875	37,490	46,860	10 minutes..	Do.
1020	L	4.80	1.008	.80	....	....	38,400	48,000	18 seconds..	Do.
1021	M	6.40	1.008	.80	23,800	29,750	37,960	47,450	9 minutes...	Do.
1022	N	6.40	1.008	.80	....	....	38,600	48,250	20 seconds..	Do.
1023	O	8.00	1.008	.80	22,800	28,500	36,520	45,650	9 minutes...	Do.
1024	P	8.00	1.008	.80	....	....	36,800	46,000	20 seconds..	Do.

Test number.	Marks.	Load at time of rupture.	Load per square inch on ruptured section.	Area at rupture.		Contraction.	Gauged length.	Elongation in gauged length.		Elongation of inch sections.
				Diameter.	Area.					
		Pounds.	*Pounds.*	*Inch.*	*Sq. inch.*	*Per cent.*	*Inches.*	*Inches.*	*Per cent.*	
1009	A	39,000	72,090	.83	.541	32.4	....	....	....	
1010	B	....	....	.83	.541	32.4	....	....	....	
1011	C	29,000	71,260	.72	.407	49.1	....	....	....	
1012	D	....	....	.80	.503	37.1	....	....	....	
1013	E	32,800	78,280	.73	.419	47.6	1	.56	56.0	″.56.
1014	F	....	....	.74	.430	46.2	1	.50	50.0	″.50.
1015	G	28,000	61,680	.76	.454	43.2	2	.78	39.0	″.30, ″.48.
1016	H	....	....	.72	.407	49.1	2	.83	41.5	″.38, ″.45.
1017	I	31,400	77,150	.72	.407	49.1	3	1.17	39.0	″.25, ″.65, ″27.
1018	J	....	....	.73	.419	47.6	3	1.08	36.0	″.22, ″.53, ″.33.
1019	K	31,900	70,260	.76	.454	43.2	4	1.28	32.0	″.23, ″.26, ″.55, ″.24.
1020	L	....	....	.73	.419	47.6	4	1.31	32.8	″.22, ″.26, ″.56, ″.27.
1021	M	32,600	80,590	.72	.407	49.1	6	1.50	25.0	″.15, ″.18, ″.26, ″.54, ″.20, ″.17.
1022	N	....	....	.73	.419	47.6	6	1.92	32.0	″.26, ″.60, ″.28, ″.25, ″.28, ″.25.
1023	O	31,200	66,950	.77	.466	41.7	8	2.07	25.9	″.16, ″.21, ″.24, ″.24, ″.32, ″.51, ″.22, ″.17.
1024	P	....	....	.77	.466	41.7	8	2.07	25.9	″.14, ″.17, ″.19, ″.22, ″.25, ″.34, ″.54, ″.22.

The object of these tests was to ascertain the relative effect of slow and rapid fractures with bars of the same metal but differing in their lengths.

The specimens were all turned to 1.″008 diameter, but in length they varied from the grooved form up to 8″, each length being in duplicate.

The differences in the results, due to the dimensions of the specimens, appear more prominent than those due to the speed of testing.

It was impracticable to obtain the elastic limit of the rapidly fractured specimens.

Rapid fracture increases the apparent tensile strength of the metal, the greatest difference being found in the short specimens, with a tendency to diminish as the specimens increase in length.

The other properties were not sensibly affected, some of the rapidly fractured bars showing greater contraction of area and elongation, while others showed lower results than the slowly fractured bars.

The appearance of the fractures were alike in each class.

ADHESION OF RAILROAD SPIKES AND LAG-SCREWS IN VARIOUS WOODS.

Spikes driven perpendicular to the grain of the wood and drawn out parallel to their length.

In computing the square inches of surface in the wood no account is taken of the tapered surfaces at the points of the spikes.

For the lag-screws the cylindrical surface threaded is used, not including the points.

RAILROAD SPIKES.

CHESTNUT TIE THAT HAD BEEN IN SERVICE SIXTEEN MONTHS.

Test number.	Kind of spike.		Description.	Length driven.	Surface in wood.	Adhesive resistance.		Remarks.
	Length.	Dimensions.				Total.	Per square inch of surface.	
	Inches.	*Inch.*		*Inches.*	*Sq. in.*	*Pounds.*	*Pounds.*	
815	5½	9/16 square....	Re-driven....................................	4½	8.44	1,496	177	Maximum resistance.
					7.88	1,185	150	Drawn ¼″.
					7.32	954	130	Drawn ½″.
					6.19	630	102	Drawn 1″.
816	5½	9/16 square....	Re-driven three hours before testing................	4.6	8.66	1,700	196	Began to draw.
					8.38	1,924	230	Drawn ⅛″; maximum resistance.
					7.54	1,550	205	Drawn ½″.
					6.41	1,140	177	Drawn 1″.
817	5½	9/16 square....	As originally driven over the rail; not disturbed when tie was taken from the track.	4.8	9.11	3,166	348	Maximum resistance.
					8.55	2,716	318	Drawn ¼″.
					7.99	2,305	289	Drawn ½″.
					6.86	1,814	264	Drawn 1″.
					5.74	1,072	187	Drawn 1½″.
818	6	9/16 square....	As originally driven over the rail; not disturbed when tie was taken from the track.	5	9.56	2,886	302	Started.
					9.00	2,960	329	Drawn ¼″; maximum resistance.
					8.44	2,548	302	Drawn ½″; split the wood between spike and end of tie.
819	5	9/16 square....	Boston and Albany, new spike driven one hour before testing.	4.4	8.21	3,118	380	Maximum resistance.
					7.65	2,200	288	Drawn ¼″.
					7.09	2,006	283	Drawn ½″.
					5.96	1,720	289	Drawn 1″.
820	5½	9/16 square....	New York Central Railroad, spike driven one hour before testing.	4.6	8.66	3,572	413	Maximum resistance.
					8.10	2,305	284	Drawn ¼″.
					7.54	2,036	270	Drawn ½″.
					6.41	1,560	243	Drawn 1″.

RAILROAD SPIKES—Continued.

CHESTNUT TIE THAT HAD BEEN IN SERVICE FOUR YEARS AND SIX MONTHS—CUT UNDER THE RAILS.

Test number.	Kind of spike.		Description.	Length driven.	Surface in wood.	Adhesive resistance.		Remarks.
	Length.	Dimensions.				Total.	Per square inch of surface.	
	Inches.	*Inch.*		*Inches.*	*Sq. in.*	*Pounds.*	*Pounds.*	
821	5.3	9/16 square...	Had been driven about six or seven months.........	4.6	8.66	2,250	260	Sudden yielding; maximum resistance.
					8.10	1,030	127	Drawn ¼".
					7.54	1,020	135	Drawn ½".
					6.41	880	137	Drawn 1".
822	5½	9/16 square ..	As originally driven over the rail..................	4.4	8.21	2,794	340	Maximum resistance; sudden yielding about ¼"; adhesive force falling to 1,700 pounds.
					6.52	1,430	219	Drawn ½".
					5.96	1,280	215	Drawn 1".
823	5½	9/16 square...	Driven in the wood at the section which was under the rail, four hours before testing.	4.4	8.21	2,265	276	Maximum resistance.
					7.65	1,706	223	Drawn ¼".
					7.09	1,240	175	Drawn ½".
					5.96	950	159	Drawn 1".
824	5.7	9/16 square...	New Boston and Albany Railroad spike, driven in wood at edge of rail seat, four and a half hours before testing.	4.8	9.11	3,200	351	Maximum resistance.
					8.55	2,548	298	Drawn ¼".
					7.99	2,390	299	Drawn ½".
					6.86	2,150	313	Drawn 1". Violent throbs.

YELLOW-PINE STICK, 4"×8"—WOOD CUT IN WINTER OF 1885 AND 1886.

Test number.	Length.	Dimensions.	Description.	Length driven.	Surface in wood.	Total.	Per square inch of surface.	Remarks.
825	5½	9/16 square...	Driven in edge of stick.............................	4.8	9.11	3,290	361	Maximum resistance; sudden yielding; load at once fell to 1,500 pounds.
					8.55	1,390	163	Drawn ¼".
					7.99	1,210	151	Drawn ½".
					6.86	1,014	148	Drawn 1".
					5.74	740	129	Drawn 1½".

YELLOW-PINE STICK, 4″×8″—SEASONED NINE YEARS.

826	5.4	9/16 square ...	Newly-driven spike	3	5.06	1,870	370	Maximum resistance.
					4.50	1,320	293	Drawn ¼″.
					3.94	1,050	266	Drawn ½″.
					2.81	560	199	Drawn 1″.
827	5.4	9/16 square ...	Newly-driven spike................................	4½	8.44	3,340	396	Maximum resistance.
					7.88	2,280	289	Drawn ¼″.
					7.32	2,040	279	Drawn ½″.
					6.19	1,860	300	Drawn 1″.
					5.07	1,480	292	Drawn 1½″.
					3.94	920	233	Drawn 2″.
828	5.6	9/16 square ...	Newly-driven spike................................	4.8	9.11	3,445	378	Maximum resistance.
					8.55	2,110	247	Drawn ¼″.
					7.99	2,080	260	Drawn ½″.
					6.86	1,790	261	Drawn 1″.
					5.74	1,380	240	Drawn 1½″.
					4.61	940	204	Drawn 2″.
					3.49	490	140	Drawn 2½″.
					2.37	235	99	Drawn 3″.
					1.25	180	144	Drawn 3½″.
829	5.7	square ...	Newly-driven spike	5.	9.56	3,640	381	Maximum resistance.
					9.00	2,595	288	Drawn ¼″.
					8.44	2,600	308	Drawn ½″.
					7.31	2,560	350	Drawn 1″.
					6.19	1,980	320	Drawn 1½″.
					5 07	1,500	296	Drawn 2″.
					3.94	920	233	Drawn 2½″.
					2.82	310	110	Drawn 3″.

YELLOW-PINE STICK, 5″×8″.

830	5½	9/16 square ...	Driven in edge of stick................................	4.4	8.21	3,110	379	Maximum resistance.
					7.65	1,750	229	Drawn ¼″.
					7.09	1,460	206	Drawn ½″.
					5.96	1,280	215	Drawn 1″.
831	5½	9/16 square ...	Driven in edge of stick................................	4.6	8.66	3,195	369	Maximum resistance. Load fluctuated between 1,300 and 2,200 pounds, while spike was drawn first ¼″.
					7.54	1,250	166	Drawn ½″.
					6.41	840	131	Drawn 1″.
832	5½	9/16 square ...	Driven in ½″ bored hole	4.65	8.77	2,650	302	Maximum resistance. Load fluctuated between 1,100 and 2,060 pounds.
					8.21	1,200	146	Drawn ¼″.
					7.65	1,050	137	Drawn ½″.
					6.52	995	153	Drawn 1″.
					5.40	890	165	Drawn 1½″.
					4.27	820	192	Drawn 2″.

RAILROAD SPIKES—Continued.

YELLOW-PINE STICK, 5″×8″—Continued.

No. of test.	Kind of spike.		Description.	Length driven.	Surface in wood.	Adhesive resistance.		Remarks.
	Length.	Dimensions.				Total.	Per square inch of surface.	
	Inches.	*Inches.*		*Inches.*	*Sq. in.*	*Pounds.*	*Pounds.*	
833	5½	9/16 square ...	Driven in 7/16″ bored hole	4.7	8.89	3,010	339	Maximum resistance. Load fluctuates between 1,300 and 1,900 pounds.
					8.33	1,500	180	Drawn ¼″.
					7.77	1,550	199	Drawn ½″.
					6.64	1,300	196	Drawn 1″.
					5.52	980	177	Drawn 1½″.
					4.39	760	173	Drawn 2″.
834	5½	9/16 square ...	Driven in ⅜″ bored hole	4.7	8.89	3,250	366	Maximum resistance.
					8.33	2,400	288	Drawn ¼″.
					7.77	1,900	245	Drawn ½″.
					6.64	1,400	211	Drawn 1″.
					5.52	1,020	185	Drawn 1½″.
					4.39	880	200	Drawn 2″.

WHITE-CEDAR TIE—UNSEASONED.

No. of test.	Length.	Dimensions.	Description.	Length driven.	Surface in wood.	Total.	Per square inch of surface.	Remarks.
835	5½	9/16 square ...	Driven in ¼″ bored hole, bored full length of spike ..	4.7	8.89	1,460	164	Maximum resistance.
					8.33	1,170	140	Drawn ¼″.
					7.77	1,080	139	Drawn ½″.
					6.64	830	125	Drawn 1″.
			Driven in ⅜″ bored hole	4.7	8.89	1,755	197	Maximum resistance.
					8.33	1,360	163	Drawn ¼″.
					7.77	1,250	161	Drawn ½″.
					6.64	1,050	158	Drawn 1″.
					5.52	840	152	Drawn 1½″.
					4.39	680	155	Drawn 2″.
836	5½	9/16 square ...	Newly-driven spike	4.9	9.34	2,305	247	Maximum resistance.
					8.78	2,190	249	Drawn ¼″.
					8.22	2,010	245	Drawn ½″.

					7.09	1,640	231	Drawn 1".
					5.97	1,240	208	Drawn 1½".
					4.84	760	157	Drawn 2".
					3.72	390	105	Drawn 2½".
837	5.6	9/16 square ...	Newly-driven spike	5	9.56	1,320	138	Maximum resistance.
					9.00	1,150	128	Drawn ¼".
					8.44	1,010	120	Drawn ½".
					7.31	680	93	Drawn 1".
					6.75	800	118	Drawn 1¼".
					6.19	620	100	Drawn 1½".
					5.07	530	105	Drawn 2".
					3.94	420	107	Drawn 2½".
			WHITE-OAK TIE—TWO YEARS AND THREE MONTHS OLD.					
838	5½	9/16 square ...	Spike drawn, and has been re-driven about thirty hours.	4.6	8.66	3,860	388	Maximum resistance.
					8.10	2,700	333	Drawn ¼".
					7.54	2,220	294	Drawn ½".
					6.41	1,280	200	Drawn 1".
					5.29	670	127	Drawn 1½".
								Spike corroded.
839	5½	9/16 square ...	As originally driven over the rail....................	4.7	8.89	4,490	505	Maximum resistance.
					8.33	3,490	419	Drawn ¼".
					7.77	2,910	375	Drawn ½".
					6.64	2,150	324	Drawn 1"
					5.52	1,620	293	Drawn 1½".
					4.39	1,220	278	Drawn 2".
					3.27	710	217	Drawn 2½".
					2.15	460	214	Drawn 3".
840	5.6	9/16 square ...	Newly-driven spike	4.7	8.89	4,330	487	Maximum resistance.
					8.33	3,260	391	Drawn ¼". Comes out with sudden throbs.
					7.77	3,040	391	Drawn ½".
					6.64	2,880	434	Drawn 1".
					5.52	2,250	408	Drawn 1½".
					4.39	1,830	417	Drawn 2".
					3.27	1,420	434	Drawn 2½".
					2.15	920	430	Drawn 3".
841	5.7	9/16 square ...	Driven in ½" hole bored full length of spike	4.9	9.34	6,595	706	Maximum resistance.
					8.78	5,695	649	Drawn ¼".
					8.22	5,480	667	Drawn ½".
					7.09	4,800	677	Drawn 1".
					5.97	4,250	712	Drawn 1½".
					4.84	3,300	682	Drawn 2".
					3.72	2,400	645	Drawn 2½".
					2.60	1,120	431	Drawn 3".

RAILROAD SPIKES—Continued.

WHITE-OAK TIE—TWO YEARS AND THREE MONTHS OLD—Continued.

No. of test.	Kind of spike.		Description.	Length driven.	Surface in wood.	Adhesive resistance.		Remarks.
	Length.	Dimensions.				Total.	Per square inch of surface.	
	Inches.	*Inches.*		*Inches.*	*Sq. in.*	*Pounds.*	*Pounds.*	
842	5.7	$\frac{9}{16}$ square ...	Re-driven spike	4.8	9.11	3,370	370	Maximum resistance.
					8.55	2,380	278	Drawn ¼″.
					7.99	2,140	268	Drawn ½″.
843	6	$\frac{9}{16}$ square ...	As originally driven over the rail........	5.3	10.24	3,965	387	Maximum resistance.
					9.68	3,180	329	Drawn ¼″.
					9.12	2,920	320	Drawn ¾″.
					7.99	2,150	270	Drawn 1″.
844	5.6	$\frac{9}{16}$ square ...	New spike driven in ½″ hole bored full length of spike.	5	9.56	5,970	625	Maximum resistance; suddenly drew out ⅜″.
			Line of pull somewhat oblique to axis of spike.		8.73	4,800	550	Drawn ½″.
					8.44	4,580	543	Drawn ¾″.
					7.31	3,900	533	Drawn 1″.
					6.19	3,350	541	Drawn 1½″.
					5.07	2,480	489	Drawn 2″.
					3.94	1,820	462	Drawn 2½″.
					2.82	830	294	Drawn 3″.

HEMLOCK TIE.

No. of test.	Length.	Dimensions.	Description.	Length driven.	Surface in wood.	Total.	Per square inch of surface.	Remarks.
845	5	$\frac{9}{16}$ square ...	Driven about two months before testing	4.25	7.88	3,690	468	Maximum resistance; sudden yielding.
					7.32	1,800	246	Drawn ¼″; sudden yielding.
					6.76	1,650	244	Drawn ¾″; sudden yielding.
					5.63	1,080	192	Drawn 1″; sudden yielding.
					4.51	820	182	Drawn 1½″; sudden yielding.
					3.38	470	139	Drawn 2″.
846	5½ Blunt point.	$\frac{9}{16}$ square ...	Driven about two months before testing........	4.55	8.55	3,280	384	Maximum resistance; sudden yielding.
					7.99	1,850	231	Drawn ¼″; sudden yielding.
					7.43	1,600	215	Drawn ¾″; sudden yielding.
					6.30	1,050	167	Drawn 1″; sudden yielding.
					5.18	880	170	Drawn 1½″; sudden yielding.
					4.05	810	200	Drawn 2″.

847	5½	9/16 square …	Driven about two months before testing in ½" bored hole.	4.75	9.00	3,390	377	Maximum resistance.
					8.44	2,060	244	Drawn ½".
					7.88	1,900	241	Drawn ¾"; sudden yielding.
					6.75	1,700	252	Drawn 1"; sudden yielding.
					5.63	1,280	227	Drawn 1½"; sudden yielding.
					4.50	1,060	236	Drawn 2".
					3.38	850	251	Drawn 2½".
					2.26	420	186	Drawn 3".
848	5½	9/16 square …	Driven about two months before testing in ⅜" bored hole.	4.9	9.84	3,110	338	Maximum resistance.
					8.64	2,000	231	Drawn 5/16"; sudden yielding.
					8.22	2,100	255	Drawn ¾"; sudden yielding.
					7.09	1,800	254	Drawn 1"; sudden yielding.
					5.97	1,750	293	Drawn 1½"; sudden yielding.
					4.84	1,300	269	Drawn 2".
					3.72	950	255	Drawn 2½".
					2.60	540	208	Drawn 3".

LAG SCREWS.

YELLOW-PINE STICK, 4" × 8".

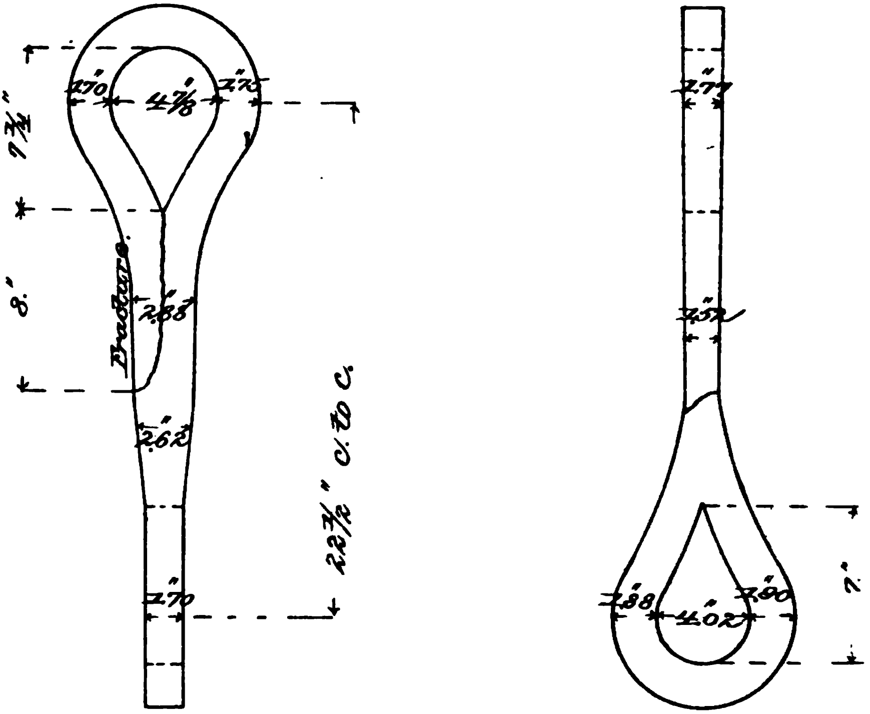
No. of test.	Diameter of lag screw.	Description.	Length in wood.	Surface in wood.	Adhesive resistance.		Remarks.
					Total.	Per square inch of surface.	
	Inch.		*Inches.*	*Sq. inches.*	*Pounds.*	*Pounds.*	
849	½	Driven into wood without any hole bored; 3" of thread in wood.	3.8	3.93	2,850	725	Began to draw.
				3.54	3,510	991	Drawn ¼". Maximum resistance.
				3.34	2,960	886	Drawn ½".
				3.15	2,590	822	Drawn ¾".
				2.36	940	398	Drawn 1".
WHITE-CEDAR TIE—UNSEASONED.							
850	⅝	Driven in ½" bored hole; 2".8 of thread in wood....	3.4	4.26	2,610	613	Out about ".8. Maximum resistance. Started at about 2,200 pounds.
				3.77	2,080	552	Drawn ¼".
				3.28	840	256	Drawn ½".
				2.30	480	209	Drawn 1".
				1.32	380	288	Drawn 1½".
HEMLOCK TIE.							
852	⅝	Screwed in ½" bored hole about two months before testing; 2".75 of thread in wood.	*3.25	5.39	4,290	796	Maximum resistance.
				4.90	3,600	735	Drawn ¼".
				4.41	1,280	290	Drawn ½".
				3.43	900	262	Drawn 1".
				2.45	510	208	Drawn 1½".
				1.47	380	200	Drawn 2".
853	⅝	Screwed in ½" bored hole about two months before testing; 2".70 of thread in wood.	*3.20	5.29	3,560	673	Maximum resistance.
				4.80	2,580	537	Drawn ¼".
				4.31	1,900	441	Drawn ½".
				3.31	510	154	Drawn 1".
				2.35	520	221	Drawn 1½".
				1.37	280	204	Drawn 2".

* Not including point.

No. 1358

New Hanger.

Concentric eyes.



WROUGHT-IRON BRIDGE-HANGERS.

TESTS MADE FOR THE MASSACHUSETTS BOARD OF RAILROAD COMMISSIONERS.

The two new hangers were forged at the Boston and Providence Railroad shop, by direction of the Massachusetts Board of Railroad Commissioners, and were made for the purpose of ascertaining the comparative strength of hangers with concentric and eccentric eyes.

The old hanger was the remaining unbroken one from the wreck of the Bussey Bridge, Boston and Providence Railroad, which fell March 14, 1887.

No. 1358.

Sectional area of stem, 2″.6×1″.52=3.98 square inches.

Applied loads.		Approximate elongation outside to outside of pin-holes.	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inch.*	
45,000	....	.05	
50,000	....	.06—	
60,000	....	.07	
70,000	....	.08	
80,000	....	.10	
90,000	....	.12	
100,000	....	.145	
110,000	....	.17	
120,000	....	.22	
130,000	....	.30	
137,600	....	.37	Snapping sound.
140,000	....	....	
143,100	35,950	.50	Ultimate strength.
100,000	....	About .75	Load at time of rupture.

Fractured hanger at large end, by opening along the weld back of the pin.

Length of fracture, 8″.

No. 1359.

Sectional area of stem, 2″.52×1″.51=3.8 square inches.

Pin in large end perpendicular to center line of testing machine; *c* and *c* in center line of testing machine.

Applied loads.		Approximate elongation outside to outside of pin-holes.	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inches.*	
10,000	....	0.	
20,000	....	.17	Pin in long eye takes bearing, both ends against buttresses of testing machine.
25,000	....	.19	
30,000	....	.21	
35,000	....	.26	
40,000	....	.31	
45,000	....	.35	
50,000	....	.38	
55,000	....	.40	
60,000	....	.42	
65,000	....	.44	
70,000	....	.46	
75,000	....	.47	
80,000	....	.49	
85,000	....	.51	
90,000	....	.53	
95,000	....	.56—	
100,000	....	.58	
105,000	....	.61	
110,000	....	.63	
115,000	....	.68	
120,000	....	.73	
125,000	....	.80	
130,000	....	.88	
132,000	34,740	.97	Ultimate strength.
78,000	....	1.15	Load at time of rupture.

Fractured the hanger at large end, opening along the weld back of the pin. Length of fracture, about 4″.

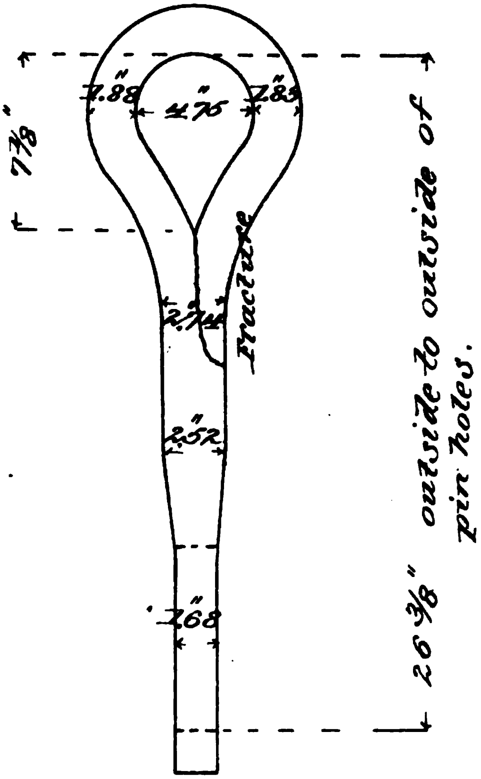
During the test the stem of the hanger yielded in the direction to receive the eccentric loading on the small end; after the test the eccentricity being found reduced to 1⅛″.

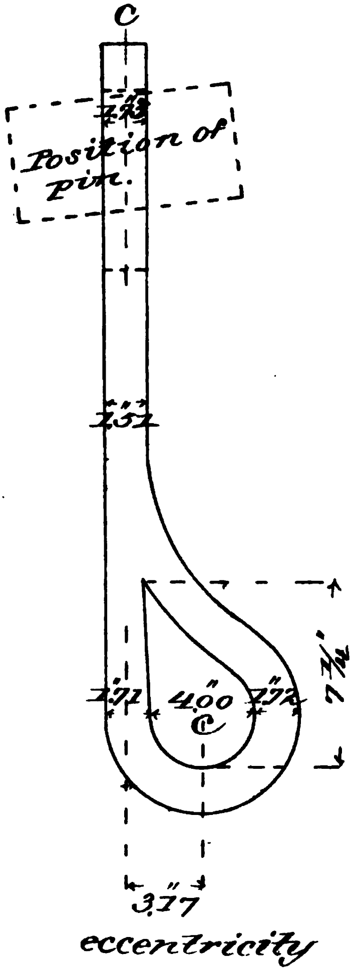
A part of the apparent elongation of this hanger was due to the oblique position of the pin in the large eye, which first bore against one buttress and one corner of the metal of the large eye.

No. 1359

New Hanger

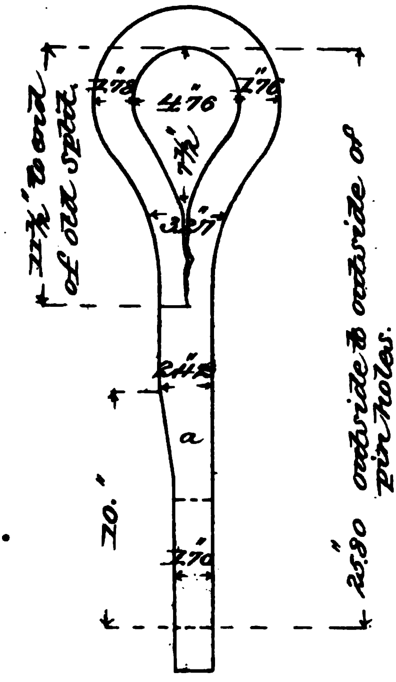
with eccentric eye.

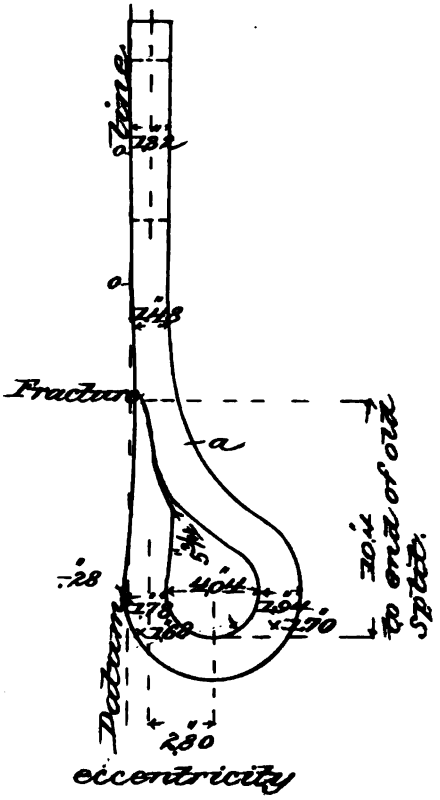




No. 1360

Old Hanger with eccentric eye.





H Ex No 16 50, 1.

No. 1360.

Sectional area of stem, 2″.42×1″.48=3.58 square inches.

Pin in large end perpendicular to datum line; *c* and *c* in center line of testing machine.

Applied loads.		Approximate elongation outside to outside of pin-holes.	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inch.*	
5,000	....	0.	
10,000	....	.04	
15,000	....	.06	
20,000	....	.08	
25,000	....	.10	
30,000	....	.12	
35,000	....	.16	
40,000	....	.20	
45,000	....	.24	
50,000	....	.28	
55,000	....	.31	
60,000	....	.34	
65,000	....	.37	
70,000	....	.40	Cracks in sight at *a*.
75,000	....	.42	
80,000	....	.45	
85,000	....	.48	
90,000	....	.51+	
95,000	....	.55	
98,200	....	....	Snapping sound.
100,000	....	.59—	
105,000	....	.62	
110,000	....	.68	
115,000	....	.73	
119,000	33,240	.79	Ultimate strength.
*90,000	....	.82	Load at time of rupture.

*About.

Fractured the hanger in the direct side or standing part of the eccentric end, 11½″ from the outside of the pin-hole.

Area of fractured metal, 2″.44×″.60=.146 square inch.

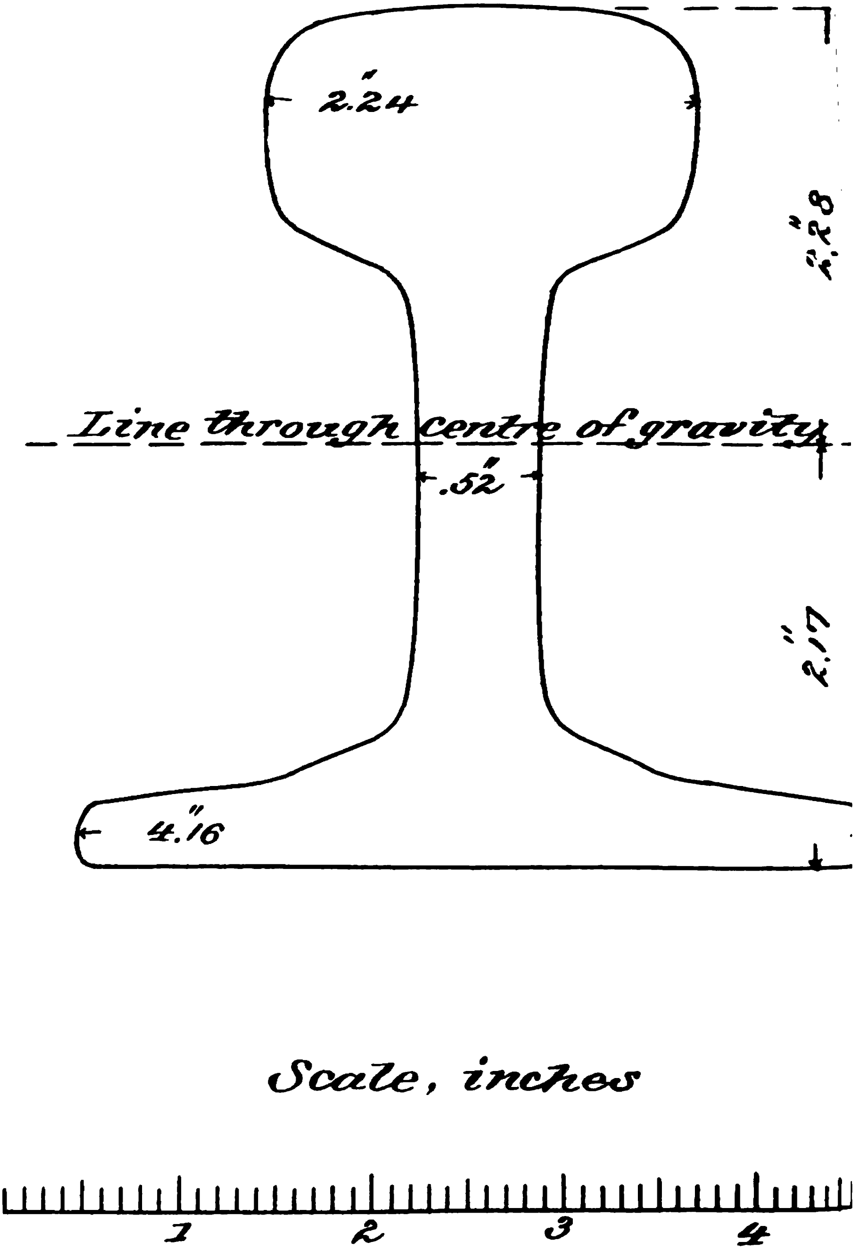
Appearance of fracture: Fibrous, 95 per cent.; granular, 5 per cent.

STEEL RAILS.

TRANSVERSE AND TENSION TESTS.

ross section of puddled stee

randed G F & E German Steel



Ex No 16 50, 1.

Transverse test.

No. 31.

l branded "F & E German Steel. 1886."
al length, 39″.90.
ight, 71½ pounds=64.5 pounds per yard.
ngth between supports, 30″.
aded at the middle.

pplied loads.		Deflections.	Successive deflections.	Deflection sets.	Remarks.
tal.	Max. fiber strain.				
nds.		*Inches.*	*Inch.*	*Inches.*	
,000	....	0.	0.	0.	Initial load.
,000	....	.0021	.0021	....	
,000	....	.0055	.0034	....	
,000	....	.0089	.0034	....	
,000	....	.0119	.0030	....	
,000	....	.0151	.0032	.0002	
,000	....	.0182	.0031	....	
,000	....	.0209	.0027	....	
,000	....	.0241	.0032	....	
,000	....	.0271	.0040	....	
,000	....	.0302	.0031	.0003	
,000	....	.0334	.0032	....	
,000	....	.0364	.0030	....	
,000	....	.0396	.0032	....	
,000	....	.0432	.0036	....	
0,000	....	.0471	.0039	.0033	
2,000	....	.0509	.0038	....	
4,000	....	.0556	.0047	....	
6,000	....	.0604	.0048	....	
8,000	....	.0659	.0055	....	
0,000	....	.0726	.0067	.0138	
2,000	....	.0901	.0175	....	
4,000	....	.1335	.0434	....	
6,000	....	.2040	.0705	....	
8,000	....	.2800	.0760	....	
0 000	....	.3635	.0835	.2845	
52 000	....	.47	.1065	....	
54 000	....	.55	.08	....	
56 000	....	.65	.10	....	
58,000	....	.76	.11	....	
60,000	....	.90	.14	....	
62 000	....	1.04	.14	....	
64 000	....	1.20	.16	....	
66 000	....	1.37	.17	....	
68 000	....	1.63	.26	....	
70 000	....	1.91	.28	....	
72 000	....	2.27	.36	....	
74 000	....	2.76	.49	2.60	Test discontinued.

Transverse test.

No. 32.

Section from same rail as No. 31.

This piece of rail has a ¾″ drilled hole in one flange of the base ¾″ from the edge.

Length between supports, 30″.

Loaded at the middle.

Applied loads.		Deflections.	Successive deflections.	Deflection sets.	Remarks.
Total.	Max. fiber strain.				
Pounds.		*Inches.*	*Inch.*	*Inches.*	
1,000	....	0.	0.	0.	Initial load.
2,000	....	.0020	.0020	....	
4,000	....	.0059	.0039	....	
6,000	....	.0093	.0034	....	
8,000	....	.0125	.0032	....	
10,000	....	.0155	.0030	.0003	
12,000	....	.0190	.0035	....	
14,000	....	.0220	.0030	....	
16,000	....	.0250	.0030	....	
18,000	....	.0285	.0035	....	
20,000	....	.0320	.0035	.0016	
22,000	....	.0357	.0037	....	
24,000	....	.0397	.0040	....	
26,000	....	.0435	.0038	....	
28,000	....	.0480	.0045	....	
30,000	....	.0527	.0047	.0079	
32,000	....	.0579	.0052	....	
34,000	....	.0635	.0056	....	
36,000	....	.0707	.0072	....	
38,000	....	.0795	.0088	....	
40,000	....	.0905	.0110	.0300	
42,000	....	.1065	.0160	....	
44,000	....	.1420	.0355	....	
46,000	....	.1885	.0465	....	
48,000	....	.2345	.0460	....	
50,000	....	.3060	.0715	.2215	
52,000	....	.38	.0740	....	
54,000	....	.48	.10	....	
56,000	....	.57	.09	....	
58,000	....	.74	.17	....	Cracks started at outside of drilled hole.
60,000	....	1.00	.26	....	Metal separated outside of drilled hole.
62,000	....	1.07	.07	....	
64,000	....	1.24	.17	....	Fracture started at inside of drilled hole.
66,000	....	1.48	.24	....	
68,000	....	1.82	.34	....	
70,000	....	2.48	.66	2.32	Test discontinued.

Opened longitudinal seams each way from the drilled hole. Appearance of fractures, fibrous and lamellar.

Tensile specimen taken from head of rail branded "Scranton Steel Co., 4–86."

Length of stem, 30″.

Diameter, 1″.129.

Sectional area, 1 square inch.

Gauged length, 30″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0045	....	
10,000	10,000	.0096	0.	
15,000	15,000	.0146	....	
20,000	20,000	.0197	.0001	
25,000	25,000	.0250	....	
30,000	30,000	.0304	.0001	
35,000	35,000	.0355	....	
40,000	40,000	.0412	.0007	
45,000	45,000	.0478	....	
50,000	50,000	.0537	.0020	E=28,433,000 pounds.
55,000	55,000	.0612	....	
55,500	55,500	.0621	....	
56,000	56,000	.0632	....	
56,500	56,500	.0645	....	
57,000	57,000	.0656	....	
57,500	57,500	.0670	....	
58,000	58,000	.0680	....	Elastic limit.
58,500	58,500	.0698	....	
59,000	59,000	.0718	....	
59,500	59,500	.0736	....	
60,000	60,000	.0754	.0123	
60,500	60,500	.0800	....	
61,000	61,000	.0850	....	
61,500	61,500	.1020	....	
62,000	62,000	.1315	....	
63,000	63,000	.1601	....	
64,000	64,000	.1760	....	
65,000	65,000	.20	....	
66,000	66,000	.21	....	
67,000	67,000	.22	....	
68,000	68,000	.24	....	
69,000	69,000	.27	....	
70,000	70,000	.30	....	
72,000	72,000	.33	....	
74,000	74,000	.37	....	
76,000	76,000	.42	....	
78,000	78,000	.47	....	
80,000	80,000	.52	....	
82,000	82,000	.57	....	
84,000	84,000	.63	....	
86,000	86,000	.68	....	
88,000	88,000	.74	....	
90,000	90,000	.80	....	
92,000	92,000	.88	....	
94,000	94,000	.96	....	
96,000	96,000	1.03	....	
98,000	98,000	1.13	....	
100,000	100,000	1.24	....	
102,000	102,000	1.33	....	
104,000	104,000	1.48	....	
106,000	106,000	1.57	....	
108,000	108,000	1.82	....	
110,000	110,000	2.10	....	
112,000	112,000	2.65	....	
112,700	112,700	3.10	....	Tensile strength.
102,000	....	....	....	Load at time of rupture.
0	0	3.43	....	=11.4 per cent.

Elongation of inch sections: ″.08, ″.08, ″.09, ″.09, ″.10, ″.09, ″.09, ″.10, ″.09, ″.10, ″.10, ″.10, ″.10, ″.11, ″.11, ″.11, ″.15, ″.13, ″.15, ″.27*, ″.25*, ″.14, ″.13, ″.12, ″.11, ″.10, ″.10, ″.08, ″.09, ″.07.

Diameter at fracture, ″.93. Area, .679 square inch. Contraction of area, 32.1 per cent.

Appearance of fracture, fine granular.

Tensile specimen taken from head of rail branded "F & E German Steel, 1886."
Total length of specimen, 36″.
Threaded ends, 1″.5 diameter.
Length of stem, 32″.
Diameter, 1″.117.
Sectional area, .98 square inch.
Gauged length, 30″.

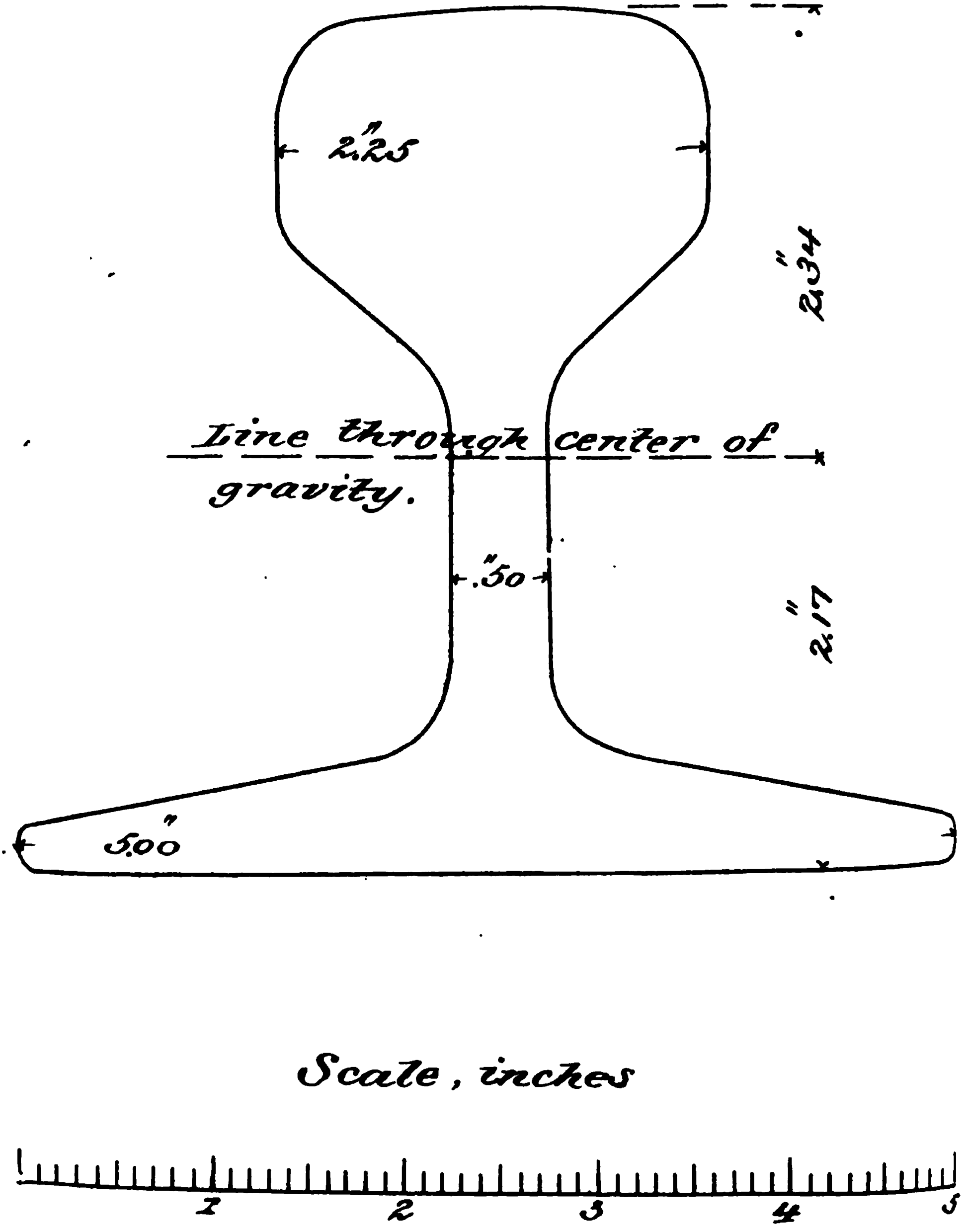
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
980	1, 000	0.	0.	Initial load.
4, 900	5, 000	.0044	....	
9, 800	10, 000	.0096	.0001	
14, 700	15, 000	.0149	....	
19, 600	20, 000	.0209	.0012	
24, 500	25, 000	.0278	.0030	E=29, 032, 000 pounds.
24, 990	25, 500	.0287	....	
25, 480	26, 000	.0292	....	
25, 970	26, 500	.0302	....	
26, 460	27, 000	.0312	....	
26, 950	27, 500	.0321	....	
27, 440	28, 000	.0335	....	
27, 930	28, 500	.0344	....	
28, 420	29, 000	.0360	....	
28, 910	29, 500	.0372	....	Elastic limit.
29, 400	30, 000	.0392	.0095	
29, 890	30, 500	.0440	....	
30, 380	31, 000	.0536	....	
30, 870	31, 500	.1055	....	
31, 360	32, 000	.1750	....	
32, 340	33, 000	.19	....	
33, 320	34, 000	.21	....	
34, 300	35, 000	.24	....	
35, 280	36, 000	.27	....	
36, 260	37, 000	.30	....	
37, 240	38, 000	.32	....	
38, 220	39, 000	.36	....	
39, 200	40, 000	.39	....	
40, 180	41, 000	.42	....	
41, 160	42, 000	.46	....	
42, 140	43, 000	.50	....	
43, 120	44, 000	.54	....	
44, 100	45, 000	.57	....	
45, 080	46, 000	.62	....	
46, 060	47, 000	.67	....	
47, 040	48, 000	.71	....	
48, 020	49, 000	.76	....	
49, 000	50, 000	.81	....	
49, 980	51, 000	.88	....	
50, 960	52, 000	.96	....	
51, 940	53, 000	1.01	....	
42, 920	54, 000	1.10	....	
53, 900	55, 000	1.18	....	
54, 880	56, 000	1.26	....	
55, 860	57, 000	1.36	....	
56, 840	58, 000	1.47	....	
57, 820	59, 000	1.56	....	
58, 800	60, 000	1.72	....	
59, 780	61, 000	1.87	....	
60, 760	62, 000	2.11	....	
61, 740	63, 000	2.35	....	
62, 720	64, 000	2.62	....	
63, 700	65, 000	3.03	....	
64, 680	66, 000	3.48	....	
65, 660	67, 000	4.55 4.91	....	Tensile strength.
60, 000	....	....	....	Load at time of rupture.
0	0	5.84	....	=19.5 per cent.

Elongation of inch sections: ″.12, ″.12, ″.14, ″.15, ″.16, ″.15, ″.1 ″.18, ″.18, ″.20, ″.22, ″.22, ″.21, ″.20, ″.21, ″.20, ″.20, ″.20, ″.19, ″.23, ″.34, ″.40*, ″.25, ″.24, ″.23, ″.20, ″.19, ″.16, ″.13, ″.13, ″.12.

Diameter at fracture, ″.91. Area, .650 square inches. Contraction of area, 33.7 per cent.

Appearance of fracture, silky, laminated, 5 per cent. granular.

Cross section of steel rail branded "Scranton Steel Co. 4-86"



No 16 50.1

Transverse test.

No. 29.

Rail branded "Scranton Steel Co., 4-86."
Total length, 39''.50.
Weight, 77¼ pounds=70.4 pounds weight per yard.
Length between end supports, 30''.
Loaded at the middle.

Applied loads.		Deflections.	Successive deflections.	Deflection sets.	Remarks.
Total.	Max. fiber strain.				
Pounds.		*Inches.*	*Inch.*	*Inch.*	
1,000	....	0.	0.	0.	Initial load.
2,000	....	.0025	.0025	....	
4,000	....	.0057	.0032	....	
6,000	....	.0089	.0032	....	
8,000	....	.0119	.0030	....	
10,000	....	.0148	.0029	.0006	
12,000	....	.0174	.0026	....	
14,000	....	.0203	.0029	....	
16,000	....	.0229	.0026	....	
18,000	....	.0259	.0030	....	
20,000	....	.0285	.0026	.0012	
22,000	....	.0314	.0029	....	
24,000	....	.0340	.0026	....	
26,000	....	.0369	.0029	....	
28,000	....	.0395	.0026	....	
30,000	....	.0422	.0027	.0016	
32,000	....	.0449	.0027	....	
34,000	....	.0487	.0038	....	
36,000	....	.0513	.0026	....	
38,000	....	.0539	.0026	....	
40,000	....	.0567	.0028	.0018	
42,000	....	.0589	.0022	....	
44,000	....	.0617	.0028	....	
46,000	....	.0644	.0027	....	
48,000	....	.0679	.0035	....	
50,000	....	.0705	.0026	.0031	
52,000	....	.0735	.0030	....	
54,000	....	.0768	.0033	....	
56,000	....	.0799	.0031	....	
58,000	....	.0832	.0033	....	
60,000	....	.0869	.0037	.0055	
62,000	....	.0897	.0028	....	
64,000	....	.0939	.0042	....	
66,000	....	.0978	.0039	....	
68,000	....	.1027	.0049	....	
70,000	....	.1075	.0048	.0108	
72,000	....	.1107	.0032	....	
74,000	....	.1154	.0047	....	
76,000	....	.1224	.0070	....	
78,000	....	.1352	.0128	....	
80,000	....	.1697	.0345	.0587	
82,000	....	.1956	.0259	....	
84,000	....	.2215	.0259	....	
86,000	....	.2642	.0427	....	
88,000	....	.2832	.0190	....	
90,000	....	.3302	.0470	.2015	
92,000	....	.3920	.0618	....	
94,000	....	.4312	.0392	....	
96,000	....	.4717	.0405	....	
98,000	....	.5172	.0455	....	
100,000	....	.5737	.0565	.4240	
10,000	....	.4379	.0139	....	Deflections under reduced loads.
20,000	....	.4517	.0138	....	
30,000	....	.4664	.0147	....	
40,000	....	.4799	.0135	....	
50,000	....	.4954	.0155	....	
60,000	....	.5096	.0142	....	
70,000	....	.5249	.0153	....	
80,000	....	.5419	.0170	....	
90,000	....	.5589	.0170	.4267	
102,000	....	.64	.0663	....	

No. 29—Continued.

Applied loads.		Deflections.	Successive deflections.	Deflection sets.	Remarks.
Total.	Max. fiber strain.				
Pounds.		*Inches.*	*Inch.*	*Inches.*	
104,000	....	.70	.06	....	
106,000	....	.76	.06	....	
108,000	....	.84	.08	....	
110,000	....	.93	.09	....	
112,000	....	1.01	.08	....	
114,000	....	1.10	.09	....	
116,000	....	1.18	.08	....	
118,000	....	1.30	.12	....	
120,000	....	1.40	.10	....	
122,000	....	1.51	.11	....	
124,000	....	1.68	.17	....	
126,000	....	1.85	.17	....	
128,000	....	2.04	.19	....	
130,000	....	2.30	.26	2.07	Test discontinued.

Transverse test.

No. 30.

Piece of same rail as No. 29.

This piece of rail has a ¾″ drilled hole in the base; center of hole ⅞″ from one edge. The hole is placed opposite the middle bearing.

Length between end supports, 30″.

Loaded at the middle.

Applied loads.		Deflections.	Successive deflections.	Deflection sets.	Remarks.
Total.	Max. fiber strain.				
Pounds.		*Inch.*	*Inch.*	*Inch.*	
1,000	....	0.	0.	0.	
2,000	....	.0018	.0018	....	
4,000	....	.0053	.0035	....	
6,000	....	.0083	.0030	....	
8,000	....	.0115	.0032	....	
10,000	....	.0142	.0027	.0004	
12,000	....	.0160	.0018	....	
14,000	....	.0198	.0038	....	
16,000	....	.0229	.0031	....	
18,000	....	.0256	.0027	....	
20,000	....	.0286	.0030	.0006	
22,000	....	.0309	.0023	....	
24,000	....	.0338	.0029	....	
26,000	....	.0368	.0030	....	
28,000	....	.0395	.0027	....	
30,000	....	.0423	.0028	.0010	
32,000	....	.0450	.0027	....	
34,000	....	.0478	.0028	....	
36,000	....	.0508	.0030	....	
38,000	....	.0536	.0028	....	
40,000	....	.0563	.0027	.0014	
42,000	....	.0593	.0030	....	
44,000	....	.0620	.0027	....	
46,000	....	.0648	.0028	....	
48,000	....	.0678	.0030	....	
50,000	....	.0708	.0030	.0028	
52,000	....	.0742	.0034	....	
54,000	....	.0773	.0031	....	
56,000	....	.0806	.0033	....	
58,000	....	.0842	.0036	....	
60,000	....	.0878	.0036	.0050	
62,000	....	.0918	.0040	....	
64,000	....	.0956	.0038	....	
66,000	....	.1008	.0052	....	
68,000	....	.1058	.0050	....	
70,000	....	.1153	.0095	.0181	
72,000	....	.1220	.0067	....	
74,000	....	.1318	.0098	....	
76,000	....	.1458	.0140	....	
78,000	....	.1646	.0188	....	
80,000	....	.1858	.0212	.0733	
82,000	....	.2198	.0340	....	
84,000	....	.2388	.0190	....	
86,000	....	.2775	.0387	....	
88,000	....	.3210	.0435	....	
90,000	....	.3730	.0520	.2410	
92,000	....	.41	.0370	....	
94,000	....	.45	.04	....	
96,000	....	.51	.06	....	
98,000	....	.57	.06	....	Cracks developed at inside of the drilled hole.
100,000	....	.63	.06	....	
100,200	....	....	....	....	Ultimate strength.

Fractured suddenly. Appearance, granular, radiating from the drilled hole in the base.

The fracture extended through the base and web and into the head of the rail.

STEEL TIRE METAL.

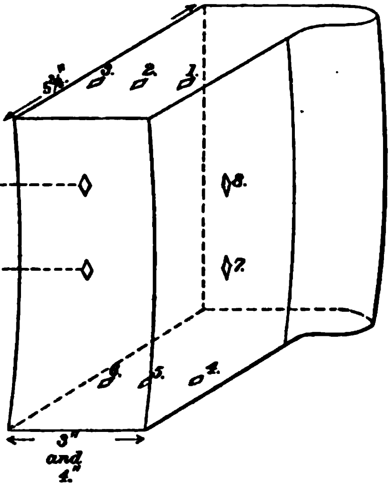
Two sections of new steel locomotive tires of the Midvale Steel Company manufacture, one of 3 inches and one of 4 inches, were furnished by Mr. J. N. Lauder, of the Old Colony Railroad Company, Boston, Mass., for comparative tests of the metal.

From these sections the hardness of the metal was ascertained at the surface of the tread, at the ends, and at the inside surfaces of each.

Four tangential tensile specimens were taken from each and are marked with the number representing the thickness of the tire and distinguishing letters, O and M, to indicate the location of the specimen in the section. Specimens O were taken out next the surface of the tread, and specimens M at the middle of the thickness of the metal.

Specific gravity determinations were made with samples cut from the metal at the ends of the tensile specimens.

Sketch of tire section, showing location of hardness cuts.



No.	Location.	Hardness.	
		3-inch tire.	4-inch tire.
1	End of section	26.99	28.68
2	......do	25.73	28.17
3	......do	25.88	26.04
4	End of section	27.32	29.22
5	......do	28.17	30.91
6	......do	25.73	27.65
7	Tread	19.70	19.81
8	......do	23.30	19.81
9	Inside surface	27.16	25.13
10	......do	26.67	24.83

No. 1304.

Marks, 3″ O.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length, 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	Initial load.
1, 000	5, 000	.0004	0.	
2, 000	10, 000	.0009	0.	
3, 000	15, 000	.0014	0.	
4, 000	20, 000	.0019	0.	
5, 000	25, 000	.0024	0.	
6, 000	30, 000	.0029	0.	
7, 000	35, 000	.0035	....	
8, 000	40, 000	.0041	....	
9, 000	45, 000	.0047	....	
10, 000	50, 000	.0052	....	
10, 200	51, 000	.0054	....	
10, 400	52, 000	.0057	....	
10, 600	53, 000	.0059	....	
10, 800	54, 000	.0061	....	Elastic limit.
11, 000	55, 000	.0064	....	
11, 200	56, 000	.0070	....	
11, 400	57, 000	.0076	....	
11, 600	58, 000	.0087	....	
11, 800	59, 000	.0097	....	
12, 000	60, 000	.0108	....	
12, 400	62, 000	.0132	....	
12, 800	64, 000	.0160	....	
13, 200	66, 000	.0185	....	
18, 600	68, 000	.0216	....	
14, 000	70, 000	.0245	....	
14, 400	72, 000	.0273	....	
14, 800	74, 000	.0306	....	
15, 200	76, 000	.0340	....	
15, 600	78, 000	.0373	....	
16, 000	80, 000	.0411	....	
16, 400	82, 000	.0448	....	
16, 800	84, 000	.0485	....	
17, 200	86, 000	.0525	....	
17, 600	88, 000	.0565	....	
18, 000	90, 000	.0610	....	
18, 400	92, 000	.0655	....	
18, 800	94, 000	.0701	....	
19, 200	96, 000	.0756	....	
19, 600	98, 000	.0805	....	
20, 000	100, 000	.0867	....	
20, 400	102. 000	.09	....	
20, 800	104, 000	.095	....	
21, 200	106, 000	.10	....	
21, 600	108, 000	.105	....	
22, 000	110, 000	.115	....	
22, 400	112, 000	.125	....	
22, 800	114, 000	.135	....	
23, 200	116, 000	.16	....	
23, 600	118, 000	.18	....	
24, 000	120, 000	.22	....	
24, 230	121, 150	.29	....	Tensile strength.
24, 000	....	....	....	Load at time of rupture.
0.	0.	.31	....	=10.3 per cent.

Elongation of inch sections, ″.11*, ″.12, ″.08.

Diameter at fracture, ″.47. Area, .1735 square inch. Contraction, 13.2 per cent.

Fractured ″.65 from neck. Appearance, granular, radiating from a point in the circumference.

Specific gravity, 7.8481.

No. 1305.

Marks, 3″ O.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length, 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	Initial load.
1,000	5,000	.0004	0.	
2,000	10,000	.0009	0.	
3,000	15,000	.0014	0.	
4,000	20,000	.0020	0.	
5,000	25,000	.0025	0.	
6,000	30,000	.0030	0.	
7,000	35,000	.0035	0.	
8,000	40,000	.0041	0.	
9,000	45,000	.0047	....	
10,000	50,000	.0054	....	
10,200	51,000	.0056	....	
10,400	52,000	.0057	....	Elastic limit.
10,600	53,000	.0061	....	
10,800	54,000	.0064	....	
11,000	55,000	.0069	....	
11,200	56,000	.0077	....	
11,400	57,000	.0085	....	
11,600	58,000	.0096	....	
11,800	59,000	.0107	....	
12,000	60,000	.0122	....	
12,400	62,000	.0146	....	
12,800	64,000	.0175	....	
13,200	66,000	.0204	....	
13,600	68,000	.0235	....	
14,000	70,000	.0265	....	
14,400	72,000	.0296	....	
14,800	74,000	.0330	....	
15,200	76,000	.0360	....	
15,600	78,000	.0397	....	
16,000	80,000	.0432	....	
16,400	82,000	.0469	....	
16,800	84,000	.0511	....	
17,200	86,000	.0558	....	
17,600	88,000	.0597	....	
18,000	90,000	.0640	....	
18,400	92,000	.0690	....	
18,800	94,000	.0735	....	
19,200	96,000	.0785	....	
19,600	98,000	.0840	....	
20,000	100,000	.0900	....	
20,400	102,000	.0963	....	
20,800	104,000	.1038	....	
21,200	106,000	.1115	....	
21,600	108,000	.1202	....	
22,000	110,000	.1303	....	
22,400	112,000	.14	....	
22,800	114,000	.15	....	
23,200	116,000	.17	....	
23,600	118,000	.20	....	
24,000	120,000	.25	....	
24,160	120,800	.31	....	Tensile strength.
23,800	....	....	....	Load at time of rupture.
0	0	.32	....	= 10.7 per cent.

Elongation of inch sections, ″.09, ″.14*, ″.09.

Diameter at fracture, ″.47. Area, .1735 square inch. Contraction, 13.2 per cent.

Fractured 1″.36 from neck. Appearance, granular, radiating from a dull spot in the circumference.

No. 1306.

Marks, 3″ M.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length, 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	Initial load.
1,000	5,000	.0003	0.	
2,000	10,000	.0009	0.	
3,000	15,000	.0015	0.	
4,000	20,000	.0020	0.	
5,000	25,000	.0026	0.	
6,000	30,000	.0031	0.	
7,000	35,000	.0036	0.	
8,000	40,000	.0041	0.	
9,000	45,000	.0047	....	
9,200	46,000	.0048	....	
9,400	47,000	.0049	....	
9,600	48,000	.0051	....	
9,800	49,000	.0053	....	Elastic limit.
10,000	50,000	.0056	....	
10,200	51,000	.0059	....	
10,400	52,000	.0062	....	
10,600	53,000	.0068	....	
10,800	54,000	.0074	....	
11,000	55,000	.0081	....	
11,200	56,000	.0090	....	
11,400	57,000	.0100	....	
11,600	58,000	.0111	....	
11,800	59,000	.0121	....	
12,000	60,000	.0133	....	
12,400	62,000	.0160	....	
12,800	64,000	.0187	....	
13,200	66,000	.0216	....	
13,600	68,000	.0245	....	
14,000	70,000	.0275	....	
14,400	72,000	.0308	....	
14,800	74,000	.0344	....	
15,200	76,000	.0378	....	
15,600	78,000	.0415	....	
16,000	80 000	.0455	....	
16,400	82,000	.0486	....	
16,800	84,000	.0530	....	
17,200	86,000	.0582	....	
17,600	88,000	.0615	....	
18,000	90,000	.0660	....	
18,400	92,000	.0707	....	
18,800	94,000	.0758	....	
19,200	96,000	.0817	....	
19,600	98,000	.0875	....	
20,000	100,000	.0936	....	
20,400	102,000	.1005	....	
20,800	104,000	.1080	....	
21,200	106,000	.1165	....	
21,600	108,000	.1258	....	
22,000	110,000	.135	....	
22,400	112,000	.145	....	
22,800	114,000	.17	....	
23,200	116,000	.19	....	
23,600	118,000	.24	....	
23,840	119,200	.30	....	Tensile strength.
23,400	....	....	....	Load at time of rupture.
0	0	.30	....	=10 per cent.

Elongation of inch sections: ″.07, ″.14*, ″.09.

Diameter of fracture, ″.47. Area, .1735 square inch. Contraction, 13.2 per cent.

Fractured 1″.15 from neck. Appearance, granular, radiating from a dull spot at the circumference.

Specific gravity, 7.8408.

No. 1307.

Marks, 3″ M.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length, 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	Initial load.
1,000	5,000	.0005	0.	
2,000	10,000	.0010	0.	
3,000	15,000	.0015	0.	
4,000	20,000	.0020	0.	
5,000	25,000	.0025	0.	
6,000	30,000	.0030	0.	
7,000	35,000	.0035	0.	
8,000	40,000	.0040	0.	
9,000	45,000	.0046	....	
9,200	46,000	.0047	....	
9,400	47,000	.0048	....	
9,600	48,000	.0050	....	
9,800	49,000	.0051	....	Elastic limit.
10,000	50,000	.0054	....	
10,200	51,000	.0057	....	
10,400	52,000	.0062	....	
10,600	53,000	.0066	....	
10,800	54,000	.0072	....	
11,000	55,000	.0081	....	
11,200	56,000	.0087	....	
11,400	57,000	.0096	....	
11,600	58,000	.0106	....	
11,800	59,000	.0120	....	
12,000	60,000	.0136	....	
12,400	62,000	.0162	....	
12,800	64,000	.0187	....	
13,200	66,000	.0215	....	
13,600	68,000	.0242	....	
14,000	70,000	.0272	....	
14,400	72,000	.0307	....	
14,800	74,000	.0340	....	
15,200	76,000	.0384	....	
15,600	78,000	.0402	....	
16,000	80,000	.0445	....	
16,400	82,000	.0487	....	
16,800	84,000	.0530	....	
17,200	86,000	.0580	....	
17,600	88,000	.0607	....	
18,000	90,000	.0644	....	
18,400	92,000	.0695	....	
18,800	94,000	.0745	....	
19,200	96,000	.0792	....	
19,600	98,000	.0845	....	
20,000	100,000	.0905	....	
20,400	102,000	.0967	....	
20,800	104,000	.1047	....	
21,200	106,000	.1115	....	
21,600	108,000	.1205	....	
22,000	110,000	.13	....	
22,400	112,000	.14	....	
22,800	114,000	.15	....	
23,200	116,000	.17	....	
23,600	118,000	.19	....	
24,000	120,000	.25	....	
24,020	120,100	.28	....	Tensile strength.
0	0	.26	....	= 8.7 per cent.

Elongation of inch section: ″.07, .″09, ″.10*.

Diameter at fracture, ″.48. Area, .181 square inch. Contraction, 9.5 per cent.

Fractured ″.95 from neck. Appearance, granular.

No. 1308.

Marks, 4″ O.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length, 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	Initial load.
1,000	5,000	.0004	0.	
2,000	10,000	.0009	0.	
3,000	15,000	.0014	0.	
4,000	20,000	.0019	0.	
5,000	25,000	.0024	0.	
6,000	30,000	.0029	0.	
7,000	35,000	.0034	0.	
8,000	40,000	.0040	0.	
9,000	45,000	.0045	....	
10,000	50,000	.0053	....	
10,200	51,000	.0054	....	
10,400	52,000	.0055	....	
10,600	53,000	.0057	....	
10,800	54,000	.0058	....	
11,000	55,000	.0059	....	Elastic limit.
11,200	56,000	.0062	....	
11,400	57,000	.0065	....	
11,600	58,000	.0069	....	
11,800	59,000	.0073	....	
12,000	60,000	.0078	....	
12,400	62,000	.0090	....	
12,800	64,000	.0111	....	
13,200	66,000	.0134	....	
13,600	68,000	.0163	....	
14,000	70,000	.0192	....	
14,400	72,000	.0223	....	
14,800	74,000	.0251	....	
15,200	76,000	.0281	....	
15,600	78,000	.0311	....	
16,000	80,000	.0342	....	
16,400	82,000	.0380	....	
16,800	84,000	.0415	....	
17,200	86,000	.0452	....	
17,600	88,000	.0491	....	
18,000	90,000	.0527	....	
18,400	92,000	.0570	....	
18,800	94,000	.0615	....	
19,200	96,000	.0660	....	
19,600	98,000	.0707	....	
20,000	100,000	.0755	....	
20,400	102,000	.0811	....	
20,800	104,000	.0868	....	
21,200	106,000	.0926	....	
21,600	108,000	.0993	....	
22,000	110,000	.1072	....	
22,400	112,000	.1165	....	
22,800	114,000	.1252	....	
23,200	116,000	.1368	....	
23,600	118,000	.15	....	
24,000	120,000	.16	....	
24,400	122,000	.18	....	
24,800	124,000	.22	....	
24,990	124,950	.30	....	Tensile strength.
0	0	.29	....	=9.7 per cent.

Elongation of inch sections: ″.08, ″12*, ″.09.

Diameter at fracture, ″.48. Area, .181 square inch. Contraction, 9.5 per cent.

Fractured 1″.30 from neck. Appearance, granular.

Specific gravity, 7.8376.

No. 1309.

Marks, 4″ O.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	Initial load.
1,000	5,000	.0004	0.	
2,000	10,000	.0009	0.	
3,000	15,000	.0014	0.	
4,000	20,000	.0019	0.	
5,000	25,000	.0025	0.	
6,000	30,000	.0030	0.	
7,000	35,000	.0035	0.	
8,000	40,000	.0040	0.	
9,000	45,000	.0015	0.	
10,000	50,000	.0051	.0002	
10,200	51,000	.0052	....	
10,400	52,000	.0054	....	Elastic limit.
10,600	53,000	.0057	....	
10,800	54,000	.0060	....	
11,000	55,000	.0066	....	
11,200	56,000	.0070	....	
11,400	57,000	.0075	....	
11,600	58,000	.0081	....	
11,800	59,000	.0093	....	
12,000	60,000	.0103	....	
12,400	62,000	.0130	....	
12,800	64,000	.0156	....	
13,200	66,000	.0184	....	
13,600	68,000	.0211	....	
14,000	70,000	.0245	....	
14,400	72,000	.0277	....	
14,800	74,000	.0305	....	
15,200	76,000	.0340	....	
15,600	78,000	.0375	....	
16,000	80,000	.0411	....	
16,400	82,000	.0445	....	
16,800	84,000	.0485	....	
17,200	86,000	.0525	....	
17,600	88,000	.0564	....	
18,000	90,000	.0612	....	
18,400	92,000	.0660	....	
18,800	94,000	.0702	....	
19,200	96,000	.0752	....	
19,600	98,000	.0802	....	
20,000	100,000	.0864	....	
20,400	102,000	.0920	....	
20,800	104,000	.1000	....	
21,200	106,000	.1075	....	
21,600	108,000	.1150	....	
22,000	110,000	.1250	....	
22,400	112,000	.1355	....	
22,800	114,000	.145	....	
23,200	116,000	.165	....	
23,600	118,000	.18	....	
24,000	120,000	.21	....	
24,270	121,850	.28	....	Tensile strength.
0	0	.29	....	=9.7 per cent.

Elongation of inch sections ″.09, ″.10*, ″.10.

Diameter at fracture, ″.48. Area, .181 square inch. Contraction, 9.5 per cent.

Fractured 1″.30 from neck. Appearance, granular; dull spot at the circumference.

No. 1310.

Marks, 4″ M.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length, 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	Initial load.
1,000	5,000	.0003	0.	
2,000	10,000	.0008	0.	
3,000	15,000	.0013	0.	
4,000	20,000	.0018	0.	
5,000	25,000	.0024	0.	
6,000	30,000	.0029	0.	
7,000	35,000	.0034	0.	
8,000	40,000	.0040	0.	
9,000	45,000	.0047	....	
9,200	46,000	.0049	....	
9,400	47,000	.0051	....	
9,600	48,000	.0053	....	
9,800	49,000	.0056	....	
10,000	50,000	.0059	....	
10,200	51,000	.0062	....	
10,400	52,000	.0065	....	
10,600	53,000	.0070	....	
10,800	54,000	.0076	....	
11,000	55,000	.0081	....	
11,200	56,000	.0091	....	
11,400	57,900	.0101	....	
11,600	58,000	.0111	....	
11,800	59,000	.0120	....	
12,000	60,000	.0132	....	
12,400	62,000	.0160	....	
12,800	64,000	.0187	....	
13,200	66,000	.0213	....	
13,600	68,000	.0245	....	
14,000	70,000	.0275	....	
14,400	72,000	.0307	....	
14,800	74,000	.0341	....	
15,200	76,000	.0375	....	
15,600	78,000	.0410	....	
16,000	80,000	.0450	....	
16,400	82,000	.0490	....	
16,800	84,000	.0530	....	
17,200	86,000	.0575	....	
17,600	88,000	.0615	....	
18,000	90,000	.0660	....	
18,400	92,000	.0711	....	
18,800	94,000	.0753	....	
19,200	96,000	.0805	....	
19,600	98,000	.0855	....	
20,000	100,000	.0917	....	
20,400	102,000	.0985	....	
20,800	104,000	.1060	....	
21,200	106,000	.1140	....	
21,600	108,000	.1235	....	
22,000	110,000	.1340	....	
22,400	112,000	.1465	....	
22,800	114,000	.17	....	
23,200	116,000	.185	....	
23,600	118,000	.21	....	
23,880	119,400	.26	....	Tensile strength.
0	0	.26	....	= 8.7 per cent.

Elongation of inch sections: ″.09*, ″.09*, ″.08.

Diameter at fracture, ″.48. Area, .181 square inch. Contraction, 9.5 per cent.

Fractured 1″.10 from neck. Appearance, granular.

Specific gravity, 7.8416.

No. 1311.

Marks, 4″ M.
Diameter, ″.505.
Sectional area, .20 square inch.
Gauged length, 3″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	Initial load.
1,000	5,000	.0004	0.	
2,000	10,000	.0009	0.	
3,000	15,000	.0014	0.	
4,000	20,000	.0019	0.	
5,000	25,000	.0025	0.	
6,000	30,000	.0029	0.	
7,000	35,000	.0035	0.	
8,000	40,000	.0040	0.	
9,000	45,000	.0046	....	
9,200	46,000	.0047	....	
9,400	47,000	.0049	....	
9,000	48,000	.0050	....	
9,800	49,000	.0051	....	
10,000	50,000	.0053	....	Elastic limit.
10,200	51,000	.0058	....	
10,400	52,000	.0062	....	
10,600	53,000	.0066	....	
10,800	54,000	.0071	....	
11,000	55,000	.0077	....	
11,200	56,000	.0082	....	
11,400	57,000	.0093	....	
11,600	56,000	.0102	....	
11,800	59,000	.0109	....	
12,000	60,000	.0121	....	
12,400	62,000	.0150	....	
12,800	64,000	.0175	....	
13,200	66,000	.0204	....	
13,600	68,000	.0230	....	
14,000	70,000	.0260	....	
14,400	72,000	.0294	....	
14,800	74,000	.0330	....	
15,200	76,000	.0361	....	
15,600	78,000	.0397	....	
16,000	80,000	.0435	....	
16,400	82,000	.0481	....	
16,800	84,000	.0523	....	
17,200	86,000	.0560	....	
17,600	88,000	.0603	....	
18,000	90,000	.0645	....	
18,400	92,000	.0686	....	
18,800	94,000	.0731	....	
19,200	96,000	.0783	....	
19,600	98,000	.0835	....	
20,000	100,000	.0900	....	
20,400	102,000	.0980	....	
20,800	104,000	.1040	....	
21,200	106,000	.1120	....	
21,600	108,000	.1200	....	
22,000	110,000	.1315	....	
22,400	112,000	.1428	....	
22,800	114,000	.16	....	
23,200	116,000	.18	....	
23,600	118,000	.20	....	
24,000	120,000	.27	....	Tensile strength.
0	0	.27	....	=9 per cent.

Elongation of inch sections: .″07, .″12*, .″08.

Diameter at fracture, .″48. Area, .181 square inch. Contraction, 9.5 per cent.

Fractured 1.″55 from neck. Appearance, granular; dull spot at circumference.

STEEL TIRE FROM RAILROAD CAR WHEEL.

Specimen taken from the flange of a 33-inch steel-tired wheel, cast-iron body.

Wheel made by the Washburn Car Wheel Company, Hartford, Conn.

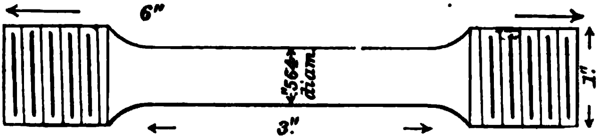
Wheel put in use February, 1876.

RECORD OF WHEEL.

Run 94,723 miles, then turned, after which it was run 120,312 miles, making a total of 215,035 miles.

Wheel was then taken out of service, but was not considered unserviceable at the time.

Form of specimen.



Sectional area of stem, .25 square inch.

Elastic limit, 8,250 pounds = 33,000 pounds per square inch.

Tensile strength, 19,420 pounds = 77,680 pounds per square inch.

Elongation in 3 inches ".17 = 5.6 per cent.

Diameter at fracture, ".55. Area, .238 square inch. Contraction of area, 5.0 per cent.

Fractured 1".12 from neck. Appearance, granular.

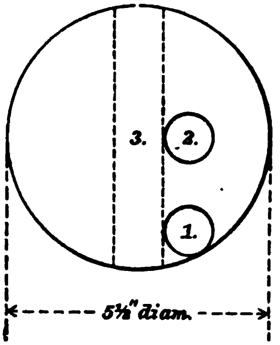
Elongation of inch sections: ".06, ".06*, ".05.

Just before the maximum load was reached a crack ".06 deep opened in the stem 1".2 from the place of final rupture. A longitudinal seam extended from the crack 1" along the stem.

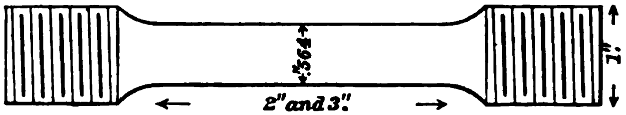
KRUPP STEEL.

Specimens from a bar representing metal used by Boston and Providence Railroad for crank pins.

Sketch showing location of specimens in the bar.



Form of specimens.



Number of test.	Marks.	Diameter.	Sectional area.	Elastic limit.		Tensile strength.		Elongation in 2 and 3 inches.	
				Total.	Per square inch.	Total.	Per square inch.	Inches.	Per cent.
		Inch.	*Sq. inch.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*		
1368	1 L	.564	.25	10,280	41,120	23,160	92,640	.49	16.3
1369	2 L	.564	.25	9,980	39,920	22,490	89,960	.56	18.6
1370	3 R	.564	.25	9,520	38,080	22,250	89,000	.30	15.0

Number of test.	Area at fracture.		Contraction of area.	Appearance of fracture.	Elongation of inch sections.
	Diameter.	Area.			
	Inch.	*Sq. inch.*	*Sq inches.*		
1368	.49	.189	24.6	Granular; silky spot at circumference.	".13, ".23*, ".13
1369	.47	.174	30.6	Granular, 40 per cent.; silky, 60 per cent.	".16, ".27*, ".13
1370	.48	.181	27.6	Granular, 60 per cent.; dull silky, 40 per cent.	".17*, ".13

* Indicates fractured section.

CAST-IRON COLUMNS.

Material contributed by Mr. W. E. Parker, superintendent Pacific Mills, Lawrence, Mass.

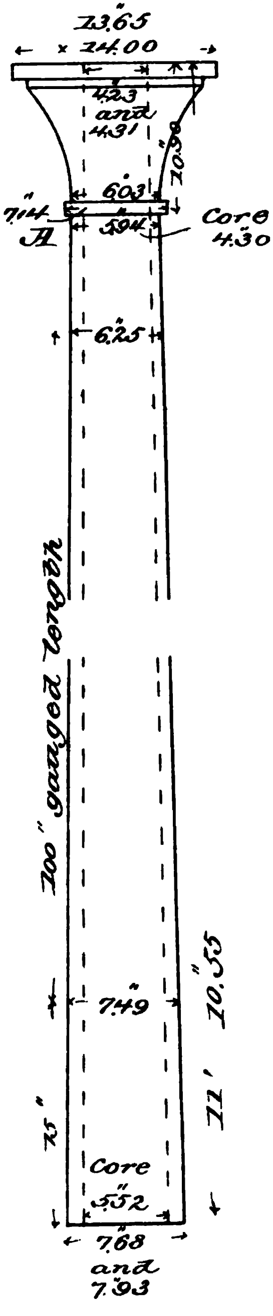
Tested at the request of Prof. G. Lanza, Massachusetts Institute of Technology, Boston, Mass.

These were old columns, which had been removed from the Pacific Mills during repairs and alterations.

The length of time they were in use and the loads sustained are not known, but from the manner of failure and the more or less spongy metal found along their lengths it is inferred that defective metal sufficiently explains the low crushing strength of some of the columns.

Columns tested in an horizontal position.

No. 990



H Ex No 16 50, 1.

No. 990.

Weight, 715 pounds.
Sectional area, minimum (at A), 13.19 square inches.
Gauged length, 100″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
10,000	....	0.	0.	Initial load.
20,000	....	.0045	....	
30,000	....	.0092	....	
40,000	....	.0141	.0015	
50,000	....	.0189	.0019	
60,000	....	.0238	.0023	
70,000	....	.0288	.0028	
80,000	....	.0340	.0032	
90,000	....	.0391	.0038	
100,000	....	.0444	.0042	
110,000	....	.0497	....	
120,000	....	.0550	.0053	
130,000	....	.0605	....	
140,000	....	.0660	.0066	
150,000	....	.0717	....	
160,000	....	.0775	.0085	
170,000	....	.0832	....	
180,000	....	.0890	.0102	
190,000	....	.0950	....	
200,000	....	.1010	.0122	
500,000	....	....	....	Snapping sound.
512,600	38,860	....	....	Ultimate strength.

Failed by opening cracks at A and deflecting downward between the middle of the length of the column and upper end, A.

No. 991.

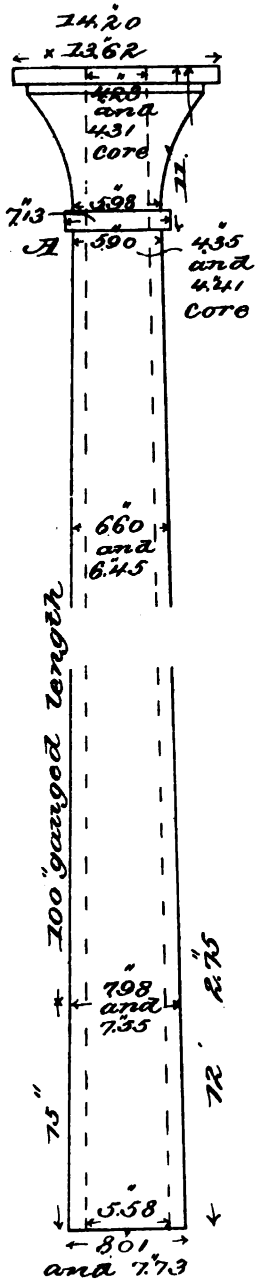
Weight, 733 pounds.
Sectional area, minimum (at A), 12.27 square inches.
Gauged length, 100″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
10,000		0.	0.	Initial load.
20,000		.0039	.0002	
30,000		.0078	.0005	
40,000		.0113	.0008	
50,000		.0152		
60,000		.0192	.0013	
70,000		.0236		
80,000		.0278	.0020	
90,000		.0322		
100,000		.0365	.0028	
110,000		.0412		
120,000		.0456	.0038	
130,000		.0503		
140,000		.0550	.0548	
150,000		.0596		
160,000		.0641	.0060	
170,000		.0692		
180,000		.0740	.0072	
190,000		.0788		
200,000		.0838	.0084	
210,000		.0884		
220,000		.0935	.0098	
230,000		.0985		
240,000		.1032	.0115	
250,000		.1084		
260,000		.1136	.0134	
270,000		.1188		
280,000		.1240	.0155	
290,000		.1293		
800,000		.1347	.0177	
522,000				Snapping sound.
531,900	43,350			Ultimate strength.

Failed by opening cracks at A, and deflecting upward near the middle. The resistance slowly fell as the deflection increased after passing the maximum load.

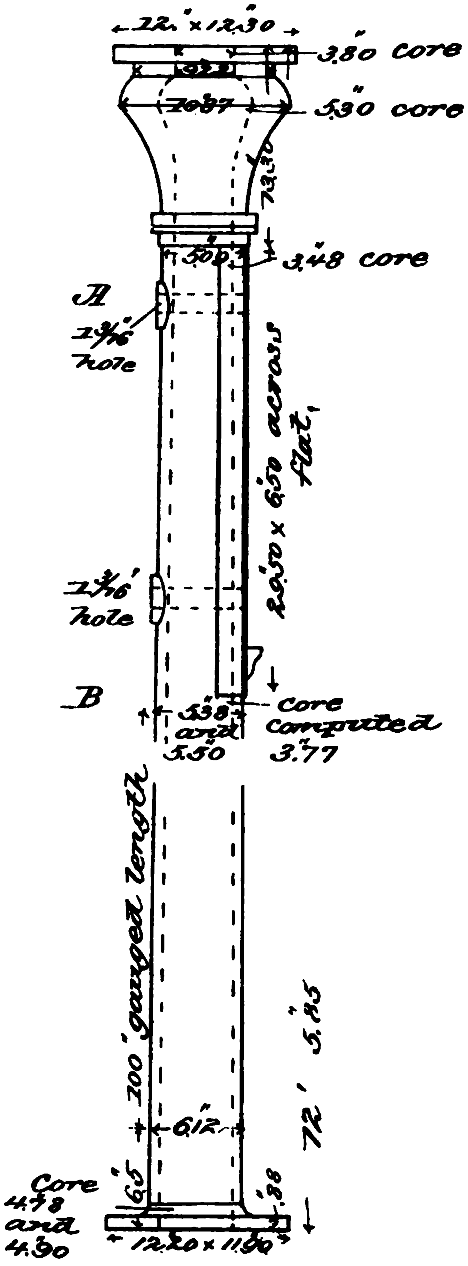
Test discontinued when the pressure fell to 510,000 pounds. The permanent deflection was now 1″.70 near the middle of its length.

No. 991



H Ex No 16 50, 1.

No. 992


12" x 12.30"
3.80" core
10.87
5.30" core
13.30
5.00"
3.48" core
A
1 3/16" hole
20.50 x 6.50 across flat
1 3/16" hole
B
5.38" and 5.50"
core computed 3.77"
200' gauged length
72' 5.85"
6.12"
Core 4.78 and 4.90
.65
.88
12.20 x 11.90"

No. 992.

Weight, 639 pounds.
Sectional area, minimum (at B), 12.08 square inches.
Gauged length, 100″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
10,000	....	0.	0.	Initial load.
20,000	....	.0045	.0004	
30,000	....	.0088	.0007	
40,000	....	.0132	.0011	
50,000	....	.0178	....	
60,000	....	.0225	.0019	
70,000	....	.0273	....	
80,000	....	.0320	.0026	
90,000	....	.0367	....	
100,000	....	.0415	.0035	
110,000	....	.0464	....	
120,000	....	.0515	.0043	
130,000	....	.0565	....	
140,000	....	.0615	.0055	
150,000	....	.0662	....	
160,000	....	.0720	.0067	
170,000	....	.0773	....	
180,000	....	.0825	.0080	
190,000	....	.0879	....	
200,000	....	.0932	.0097	
210,000	....	.0988	....	
220,000	....	.1043	.0113	
230,000	....	.1098	....	
240,000	....	.1150	.0132	
250,000	....	.1207	....	
260,000	....	.1263	.0153	
270,000	....	.1320	....	
280,000	....	.1375	.0177	
290,000	....	.1434	....	
300,000	....	.1493	.0205	
404,700	33,500	....	....	Ultimate strength.

Failed by opening cracks at A, and deflecting upwards at the middle. Load fell to 380,000 pounds, when test was discontinued, the permanent deflection being 1″.8.

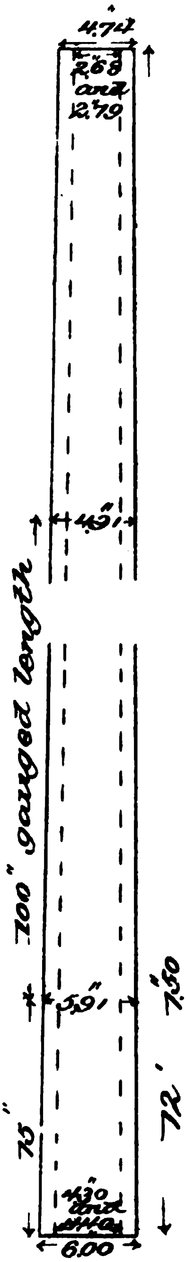
No. 993.

Weight, 474 pounds.
Sectional area (minimum), 11.75 square inches.
Gauged length, 100″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,000		0.	0.	Initial load.
10,000		.0012	.0002	
15,000		.0033	.0002	
20,000		.0052	.0002	
25,000		.0080	.0002	
30,000		.0103	.0000	
35,000		.0127		
40,000		.0154	0.	
50,000		.0209		
60,000		.0263	.0005	
70,000		.0319		
80,000		.0375	.0010	
90,000		.0432		
100,000		.0490	.0022	
110,000		.0549		
120,000		.0612	.0028	
130,000		.0669		
140,000		.0730	.0040	
150,000		.0792		
160,000		.0856	.0055	
170,000		.0920		
180,000		.0988	.0074	
190,000		.1054		
200,000		.1128	.0101	
210,000		.1200		
220,000		.1280	.0133	
315,400	26,840			Ultimate strength.

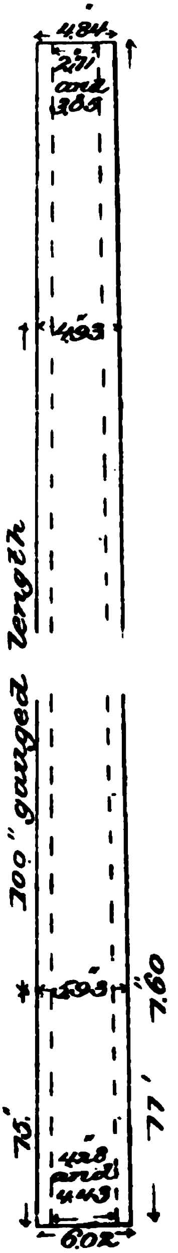
Failed by triple flexure.

No. 993



H Ex No 16 50, 1.

No. 994


4.84
2.71 and 3.89
4.93
100" gauged length
5.93
7.60
75'
77'
4.28 and 4.43
6.02

No. 994.

Weight, 439 pounds.
Sectional area (minimum), 11.89 square inches.
Gauged length, 100″.

Applied loads.		In gauged length.		Deflections at middle.		Remarks.
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
5,000		0.	0.	0.	0.	Initial load.
10,000		.0014	0.	0.	0.	
15,000		.0033	—.0001	0.	.01	
20,000		.0053	—.0001	0.	.01	
25,000		.0079	—.0001	0.	.02	
30,000		.0103	—.0001	0.	.01	
35,000		.0128		0.	.02	
40,000		.0156	.0010	0.	.02	Deflection sets.
50,000		.0205		0.	.02	
60,000		.0258	.0013	0.	.02	0 0
70,000		.0312		0.	.02	
80,000		.0366	.0018	0.	.02	0 0
90,000		.0420		0.	.02	
100,000		.0477	.0024	0.	.02	0 0
110,000		.0533		0.	.02	
120,000		.0589	.0035	0.	.02	0 0
130,010		.0648		0.	.02	
140,000		.0708	.0049	0.	.02	0 0
150,000		.0768		0.	.02	
160,000		.0830	.0065	0.	.02	0 0
170,000		.0894		0.	.02	
180,000		.0955	.0086	0.	.02	0 0
190,000		.1023		0.	.02	
200,000		.1090	.0112	0.	.02	0 0
210,000		.1158		0.	.02	
220,000		.1229	.0148	0.	.02	0 0
230,000		.1307		0.	.02	
240,000		.1383	.0185	0.	.02	0 0
250,000		.1470		0.	.02	
260,000		.1550	.0242	0.	.02	0 0
361,100	30,370					Ultimate strength.

Failed by triple flexure.

Cut apart 4½ feet from upper end at the point of maximum deflection and found spongy metal on the concave side of the post.

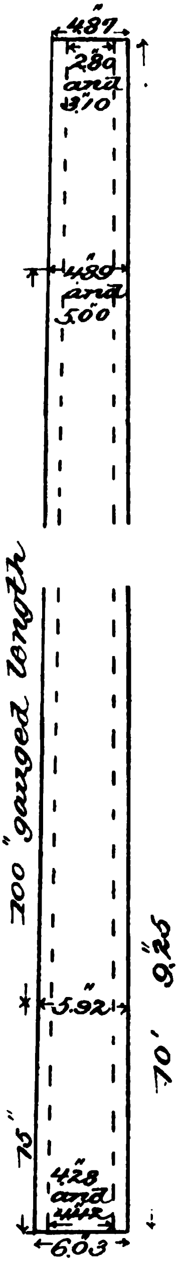
No. 995.

Weight, 431 pounds.
Sectional area (minimum), 11.80 square inches.
Gauged length, 100″.

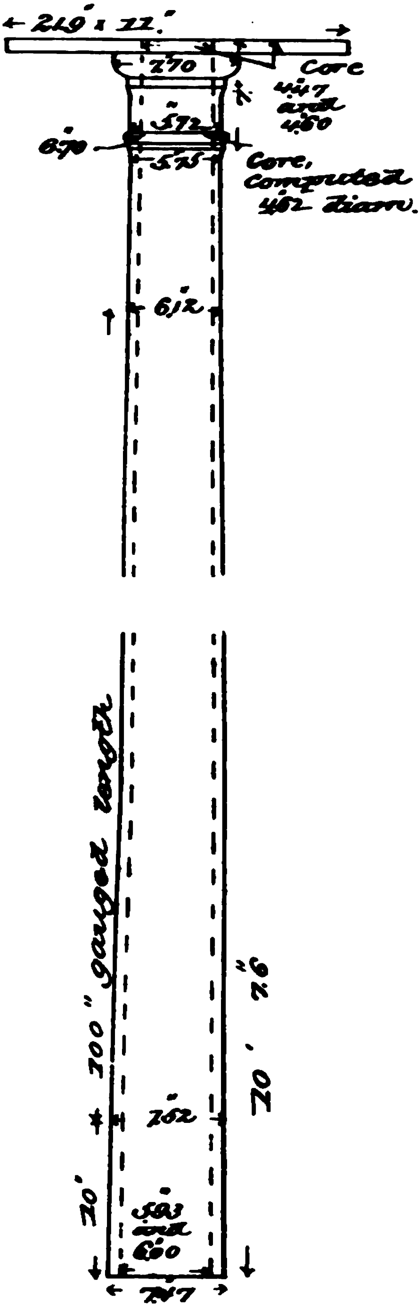
Applied loads.		In gauged length.		Deflections at middle.		Remarks.	
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.		
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*		
5,000	0.	0.	0.	0.	0.	Initial load.	
10,000	....	.0018	.0002	0.	0.		
15,000	....	.0039	.0003	0.	0.		
20,000	....	.0063	.0003	0.	0.		
30,000	....	.0085	.0004	0.	0.		
30,000	....	.0110	.0004	0.	0.		
35,000	....	.0135	....	0.	0.		
40,000	....	.0160	.0004	0.	0.		
50,000	....	.0208	....	0.	0.		
60,000	....	.0259	.0007	0.	0.		
70,000	....	.0318	....	0.	0.		
80,000	....	.0365	.0012	0.	0.		
90,000	....	.0420	....	0.	0.		
100,000	....	.0473	.0018	0.	0.	Deflection sets.	
110,000	....	.0538	....	0.	0.		
120,000	....	.0585	.0028	0.	— 01	0.	0.
130,000	....	.0644	....	0.	— 01	0.	
140,000	....	.0700	.0039	0.	— 01	0.	0.
150,000	....	.0763	....	0.	— 02		
160,000	....	.0820	.0053	0.	— 02	0.	0.
170,000	....	.0882	....	0.	— 03		
180,000	....	.0945	.0071	0.	— 03	0.	0.
190,000	....	.1012	....	0.	— 03		
200,000	....	.1076	.0093	0.	— 04	0.	0.
210,000	....	.1143	....	— 02	— 04		
220,000	....	.1213	.0120	— 02	— 04	0.	0.
230,000	....	.1288	....	— 03	— 05		
240,000	....	.1365	.0160	— 03	— 06	0.	—″.02
250,000	....	.1445	....	— 03	— 06		
260,000	....	.1528	.0211	— 04	— 07	—″.01	— .02
352,000	29,830	....	....	....	....	Ultimate strength.	

Failed by triple flexure, the deflection at the middle following the same direction the post took in the early part of the test.

No. 995


4.87"
2.89 and 3.10
4.89 and 5.00
200" gauged length
5.92"
70' 9.25"
75"
4.28 and 4.42
6.03

No. 996



H Ex No 16 50, L

No. 996.

Weight, 598 pounds.
Sectional area (minimum), 8.94 square inches.
Gauged length, 100″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
10,000	....	0.	0.	Initial load.
20,000	....	.0025	0.	
30,000	....	.0071	.0002	
40,000	....	.0108	.0003	
50,000	....	.0145	.0004	
60,000	....	.0184	.0005	
70,000	....	.0222	....	
80,000	....	.0262	.0008	
90,000	....	.0300	....	
100,000	....	.0340	.0012	
110,000	....	.0384	....	
120,000	....	.0422	.0015	
130,000	....	.0463	....	
140,000	....	.0505	.0021	
150,000	....	.0548	....	
160,000	....	.0590	.0028	
170,000	....	.0632	....	
180,000	....	.0675	.0035	
190,000	....	.0719	....	
200,000	....	.0764	.0043	
210,000	....	.0807	....	
220,000	....	.0852	.0052	
230,000	....	.0897	....	
240,000	....	.0943	.0062	
250,000	....	.0990	....	
260,000	....	.1035	.0075	
270,000	....	.1085	....	
280,000	....	.1133	.0090	
290,000	....	.1185	....	
300,000	....	.1233	.0110	
310,000	....	.1285	....	
320,000	....	.1338	.0131	
330,000	....	.1392	....	
340,000	....	.1444	.0155	
566,000	63,310	....	....	Ultimate strength.

Failed by triple flexure. Spongy metal on concave side, 4 feet 7 inches from upper end of the post.

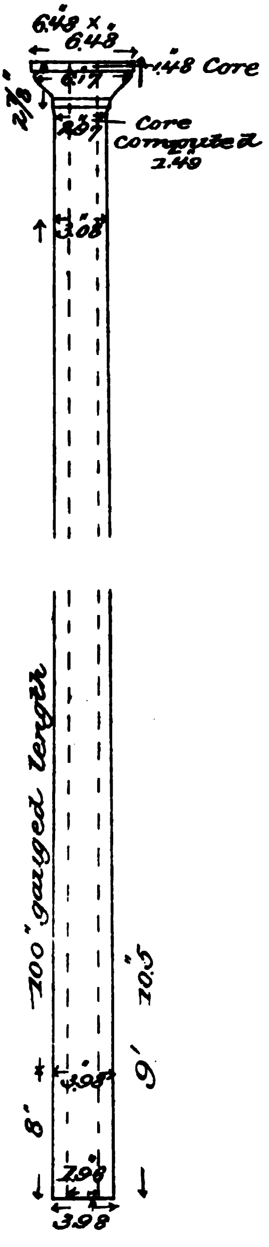
No. 997.

Weight, 240 pounds.
Sectional area (minimum), 5.19 square inches.
Gauged length, 100″.

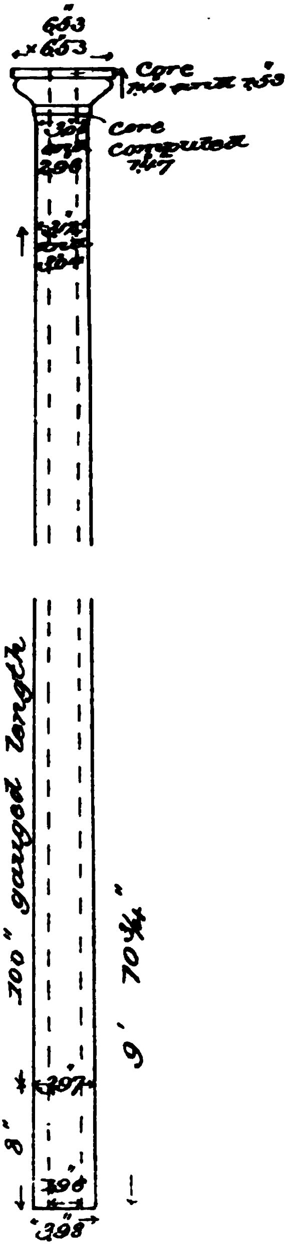
Applied loads.		In gauged length.		Deflections at middle.		Remarks.	
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.		
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*		
5,000	....	0.	0.	0.	0.	Initial load.	
						Deflection sets.	
10,000	....	.0030	0.	0.	.01	0.	0.
15,000	....	.0072	.0002	0.	.01	0.	0.
20,000	....	.0115	.0005	0.	.01	0.	0.
25,000	....	.0160	....	0.	.01		
30,000	....	.0206	.0010	0.	.01	0.	0.
35,000	....	.0265	....	0.	.02		
40,000	....	.0302	.0019	0.	.02	0.	0.
45,000	....	.0351	....	0.	.02		
50,000	....	.0401	.0028	0.	.02	0.	0.
55,000	....	.0452	....	0.	.02		
60,000	....	.0504	.0040	0.	.02	0.	0.
65,000	....	.0556	....	0.	.02		
70,000	....	.0610	.0054	0.	.02	0.	0.
80,000	....	.0718	.0070	0.	0.	0.	0.
90,000	....	.0828	....	−.03	−.01		
100,000	....	.0944	.0105	−.04	−.02	0.	0.
110,000	....	.1065	....	−.06	−.03		
120,000	....	.1189	.0154	−.08	−.04	0.	0.
130,000	....	.1324	....	−.11	−.06		
140,000	....	.1472	.0230	−.15	−.08	−″.04	−″.03
150,000	....	....	....	−.22	−.13		
160,000	....	....	....	−.38	−.22		
164,000	....	....	....	−.52	−.30		
165,000	....	....	....	−.60	−.37		
165,300	31,850	....	....	−.68	−.42	Ultimate strength.	
165,000	....	....	....	−.80	−.50		
164,500	....	....	....	−.85	−.53		
5,000	....	....	....	−.36	−.24		

Failed by triple flexure.

No. 997


6.48" × 6.48"
6.48
1.48" Core
6.17
2 7/8"
2.37
Core computed 2.49"
3.08"
100" gauged length
10.5"
9'
8'
4.98"
1.98"
3.98

No. 998


6.53
6.53
Core
7.53
Core
Computed
7.47
298
304
700" gauged length
9' 70¾"
8"
297
296
398

No. 998.

Weight, 240 pounds.
Sectional area (minimum), 5.27 square inches.
Gauged length, 100″.

Applied loads.		In gauged lengths.		Deflections at middle.		Remarks.
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inches.*	
5,000	....	0.	0.	0.	0.	Initial load.
10,000	....	.0040	.0002	0.	0.	
15,000	....	.0088	.0004	0.	0.	
20,000	....	.0137	.0006	0.	0.	Deflection sets.
25,000	....	.0189	....	0.	— .01	
30,000	....	.0242	.0012	0.	— .01	0. 0.
35,000	....	.0294	....	— .01	— .02	
40,000	....	.0349	.0019	— .01	— .03	0. 0.
45,000	....	.0403	....	— .01	— .03	
50,000	....	.0458	.0026	— .01	— .04	0. 0.
55,000	....	.0516	....	— .02	— .04	
60,000	....	.0572	.0037	— .02	— .05	0. 0.
65,000	....	.0632	....	— .02	— .06	
70,000	....	.0692	.0050	— .03	— .07	0. 0.
75,000	....	.0752	....	— .03	— .08	
80,000	....	.0815	.0065	— .04	— .08	0. 0.
90,000	....	.0944	....	— .04	— .11	
100,000	....	.1083	.0108	— .05	— .14	0. —″.02
110,000	....	.1225	....	— .06	— .17	
120,000	....	.1384	.0168	— .07	— .22	—″.02 —″.04
130,000	....	....	....	— .10	— .30	
140,000	....	....	....	— .14	— .39	
145,000	....	....	....	— .17	— .46	
150,000	....	....	....	— .21	— .54	
155,000	....	....	....	— .27	— .68	
158,000	....	....	....	— .33	— .93	
158,040	29,990	....	....	— .40	—1.00	Ultimate strength.
157,500	....	....	....	— .50	—1.12	
157,000	....	....	....	— .51	—1.17	
5,000	....	....	....	— .23	— .45	

Failed by triple flexure.

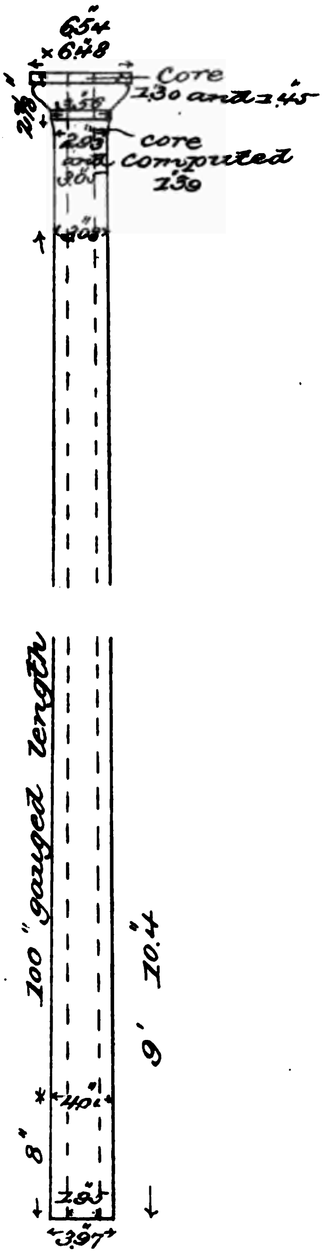
No. 999.

Weight, 242 pounds.
Sectional area (minimum), 5.50 square inches.
Gauged length, 100″.

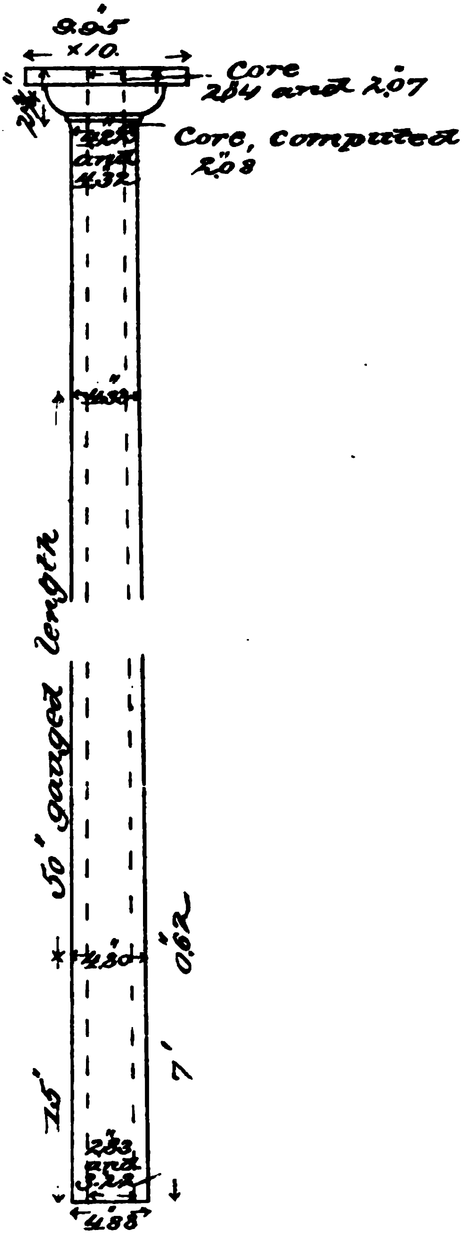
Applied loads.		In gauged length.		Deflections at middle.		Remarks.
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
5,000	....	0.	0.	0.	0.	Initial load.
10,000	....	.0037	.0002	0.	0.	
15,000	....	.0074	.0003	0.	0.	
20,000	....	.0115	.0004	0.	0.	
25,000	....	.0152	....	0.	0.	
30,000	....	.0198	.0009	0.	0.	
35,000	....	.0237	....	0.	0.	
40,000	....	.0279	.0014	0.	0.	
45,000	....	.0323	....	0.	0.	
50,000	....	.0365	.0020	0.	0.	
55,000	....	.0408	....	0.	0.	
60,000	....	.0453	.0028	0.	0.	
65,000	....	.0500	....	0.	0.	
70,000	....	.0546	.0038	0.	0.	
75,000	....	.0592	....	0.	0.	
80,000	....	.0639	.0049	0.	0.	
90,000	....	.0735	....	0.	0.	
100,000	....	.0839	.0075	0.	0.	
110,000	....	.0930	....	0.	0.	
120,000	....	.1030	.0105	0.	.02	
130,000	....	.1132	....	0.	.03	
140,000	....	.1235	.0144	0.	.04	
150,000	....	....	....	0.	.05	
160,000	....	....	....	0.	.08	
170,000	....	....	....	— .03	.13	
175,000	....	....	....	— .07	.18	
180,000	....	....	....	— .11	.28	
182,000	....	....	....	— .15	.35	
183,000	....	....	....	— .20	.40	
183,400	33,350	....	....	— .25	.50	Ultimate strength.
183,000	....	....	....	— .31	.60	
182,000	....	....	....	— .38	.70	
5,000	....	....	....	— .16	.27	

Failed by triple flexure.

No. 999


6.54"
× 6.48"
Core
1.30 and 1.45"
3.56
2.18"
2.93
and
3.06
core
computed
1.39
3.08"
100" gauged length
9' 10.4"
4.01"
8"
1.92"
3.97"

No. 1000



H Ex No 16 50, 1

No. 1000.

Weight, 271 pounds.
Sectional area (minimum), 10.92 square inches.
Gauged length, 50″.

Applied loads.		In gauged length.		Deflection at middle.		Remarks.
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
5,000	....	0.	0.	0.	0.	Initial load.
10,000	....	.0011	—.0001	0.	0.	
20,000	....	.0041	.0000	0.	0.	
30,000	....	.0073	.0001	0.	0.	
40,000	....	.0105	.0003	0.	0.	
50,000	....	.0141	.0005	0.	0.	
60,000	....	.0172	.0007	0.	0.	
70,000	....	.0207	....	0.	0.	
80,000	....	.0242	.0012	0.	0.	
90,000	....	.0275	....	0.	0.	
100,000	....	.0312	.0019	0.	0.	
120,000	....	.0385	....	0.	0.	
140,000	....	.0463	.0038	0.	0.	
160,000	....	.0544	....	0.	0.	
180,000	....	.0628	.0070	0.	0.	
200,000	....	.0730	....	0.	0.	
220,000	....	.0815	.0121	0.	0.	
240,000	....	.0920	....	0.	0.	
260,000	....	.1033	.0205	0.	0.	
280,000	....	....	....	0.	0.	
300,000	....	....	....	0.	.02	
320,000	....	....	....	—.02	.05	
330,000	....	....	....	—.05	.10	
335,000	....	....	....	—.08	.12	
340,000	....	....	....	—.10	.15	
343,000	....	....	....	—.15	.20	
350,000	....	....	....	—.22	.33	
350,900	32,130	....	....	—.28	.40	Ultimate strength.
349,000	....	....	....	—.41	.55	
348,000	....	....	....	—.45	.60	
347,000	....	....	....	—.47	.63	
5,000	....	....	....	—.36	.45	

Failed by triple flexure.

NATURAL STONES.

THE MODULI OF ELASTICITY AND TRANSVERSE STRENGTH OF SANDSTONES AND GRANITE.

Material furnished by Messrs. Norcross Brothers, Boston, Mass.

The moduli of elasticity were obtained from compression loads, after which the stones were placed on supports 18 inches apart and broken by transverse loads applied at the middle.

The computed values of the moduli of elasticity are stated for ascending and descending compression loads, based on the elasticity of the material after it had previously been subjected to compression stresses. This was done to obtain readings independent of the permanent sets which accompanied the first application of stresses.

The modulus of elasticity was found to vary, its value gradually increasing with the ascending loads and diminishing with the descending loads.

Other tests have been made with natural stones in which the modulus was nearly uniform under different loads.

The approximate ages, from the quarry, of these sandstones when tested were, Worcester, one year; Kibbe, six years, and Ohio, three years. The Worcester granite had been quarried about two years.

No. 1291.

Compression test.

WORCESTER QUARRY SANDSTONE.

Length, 20″.03.
Sectional area, 4″×5″.99=23.96 square inches.
Weight, 37½ pounds=135.6 pounds per cubic foot.
Gauged length, 9″.97.

Applied loads.		Compression.	Successive Compression.	Set.	Remarks.
Total.	Per square inch.				
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	
2,396	100	0.	0.	0.	Initial load.
23,960	1,000	.0069	.0069	.0023	
23,960	1,000	.0070	.0001	.0025	
47,920	2,000	.0116	.0046	.0035	
47,920	2,000	.0117	.0001	.0033	
71,880	3,000	.0150	.0033	.0032	
71,880	3,000	.0150	0.	.0034	
95,840	4,000	.0182	.0032	.0034	
95,840	4,000	.0182	0.	.0033	
119,800	5,000	.0212	.0030	.0034	
119,800	5,000	.0213	.0001	.0036	
23,960	1,000	.0077	.0041	....	
47,920	2,000	.0118	.0041	....	
71,880	3,000	.0152	.0034	....	
95,840	4,000	.0183	.0031	....	
119,800	5,000	.0213	.0030	....	
95,840	4,000	.0187	.0026	....	
71,880	3,000	.0158	.0029	....	
47,920	2,000	.0127	.0031	....	
23,960	1,000	.0083	.0044	.0036	
143,760	6,000	.0245	.0162	.0037	
167,720	7,000	.0276	.0031	.0034	
119,800	5,000	.0215	.0061	....	
119,800	5,000	.0216	.0001	....	After remaining loaded one hour.
191,680	8,000	.0308	.0091	.0034	
191,680	8,000	.0310	.0002	.0034	
23,960	1,000	.0072	.0038	....	E=2,381,300.
47,920	2,000	.0113	.0041	....	E=2,431,700.
71,880	3.000	.0152	.0039	....	E=2,556,400.
95,840	4,000	.0187	.0035	....	E=2,848,600.
119,800	5,000	.0219	.0032	....	E=3,115,600.
143,760	6,000	.0250	.0031	....	E=3,216,100.
167,720	7,000	.0280	.0030	....	E=3,323,300.
191,680	8,000	.0310	.0030	....	E=3,323,300.
167,720	7,000	.0285	.0025	....	E=3,988,000.
143,760	6,000	.0258	.0027	....	E=3,692,600.
119,800	5,000	.0230	.0028	....	E=3,560,700.
95,840	4,000	.0201	.0029	....	E=3,437,900.
71,880	3,000	.0168	.0033	....	E=3,021,200.
47,920	2,000	.0127	.0041	....	E=2,431,700.
23,960	1,000	.0084	.0043	....	E=2,318,600.
2,396	100	.0035	.0049	....	E=1,831,200.

Small piece (½ ounce weight) flaked off one edge near middle of stone.
Test discontinued.

No. 1292.

Compression test.

SANDSTONE.

Length, 20″.03.
Sectional area, 4″×6″=24 square inches.
Weight, 35⅓ pounds=127.4 pounds per cubic foot.
Gauged length, 9″.98.

Applied loads.		Compression.	Successive compression.	Set.	Remarks.
Total.	Per square inch.				
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	
2,400	100	0.	0.	0.	Initial load.
24,000	1,000	.0228	.0228	.0093	
48,000	2,000	.0347	.0119	.0108	E= 968,930.
72,000	3,000	.0464	.0117	.0135	E=1,108,900.
85,000	3,540	....	....	....	Ultimate strength.

No. 1293.

Compression test.

KIBBE QUARRY SANDSTONE.

Length, 20″.03.
Sectional area, 3″.99×6″.03=24 square inches.
Weight, 39¼ pounds=141 pounds per cubic foot.
Gauged length, 9″.98.

Applied loads.		Compression.	Successive compression.	Set.	Remarks.
Total.	Per square inch.				
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	
2,400	100	0.	0.	0.	Initial load.
24,000	1,000	.0083	.0083	.0027	
24,000	1,000	.0082	—.0001	.0029	
48,000	2,000	.0139	.0057	.0039	
48,000	2,000	.0139	0.	.0039	
72,000	3,000	.0179	.0040	.0040	
72,000	3,000	.0178	—.0001	....	
96,000	4,000	.0216	.0038	.0044	
96,000	4,000	.0217	.0001	....	
120,000	5,000	.0251	.0034	.0046	
120,000	5,000	.0252	.0001	.0048	
24,000	1,000	.0097	.0049	....	
48,000	2,000	.0141	.0044	....	
72,000	3,000	.0179	.0038	....	
96,000	4,000	.0217	.0038	....	
120,000	5,000	.0251	.0034	....	
96,000	4,000	.0220	.0031	....	
72,000	3,000	.0192	.0028	....	
48,000	2,000	.0156	.0036	....	
24,000	1,000	.0112	.0044	.0048	
144,000	6,000	.0287	.0175	.0049	
144,000	6,000	.0288	.0001	....	
168,000	7,000	.0324	.0036	.0051	
168,000	7,000	.0323	—.0001	....	
192,000	8,000	.0359	.0036	.0052	
192,000	8,000	.0363	.0004	.0054	
24,000	1,000	.0105	.0051	....	
48,000	2,000	.0151	.0046	....	
72,000	3,000	.0191	.0040	....	
96,000	4,000	.0226	.0035	....	
120,000	5,000	.0259	.0033	....	
144,000	6,000	.0293	.0034	....	
168,000	7,000	.0326	.0033	....	
192,000	8,000	.0364	.0038	....	
168,000	7,000	.0337	.0027	....	
144,000	6,000	.0304	.0033	....	
120,000	5,000	.0277	.0027	....	
96,000	4,000	.0246	.0031	....	
72,000	3,000	.0210	.0036	....	
48,000	2,000	.0174	.0036	....	
24,000	1,000	.0125	.0049	.0055	
120,000	5,000	.0262	.0137	....	
144,000	6,000	.0295	.0033	....	
120,000	5,000	.0267	.0028	....	
144,000	6,000	.0295	.0028	....	
120,000	5,000	.0269	.0026	....	
120,000	5,000	.0267	—.0002	....	
Stone remained under load fifteen hours.					
120,000	5,000	.0268	.0001	.0057	
24,000	1,000	.0109	.0052	....	E=1,727,300.
48,000	2,000	.0154	.0045	....	E=2,217,800.
72,000	3,000	.0194	.0040	....	E=2,495,000.
96,000	4,000	.0229	.0035	....	E=2,851,400.
120,000	5,000	.0264	.0035	....	E=2,851,400.
144,000	6,000	.0294	.0030	....	E=3,326,700.
168,000	7,000	.0331	.0037	....	E=2,697,300.
192,000	8,000	.0364	.0033	....	E=3,024,200.
168,000	7,000	.0334	.0030	....	E=3,326,700.
144,000	6,000	.0307	.0027	....	E=3,696,300.
120,000	5,000	.0278	.0029	....	E=3,441,400.
96,000	4,000	.0248	.0030	....	E=3,326,700.
72,000	3,000	.0213	.0035	....	E=2,851,400.
48,000	2,000	.0176	.0037	....	E=2,697,300.
24,000	1,000	.0127	.0049	....	E=2,036,600.
2,400	100	.0055	.0072	....	E=1,247,500.

Test discontinued.

No. 1294.

Compression test.

OHIO SANDSTONE.

Length, 19″.98.
Sectional area, 4″.00 × 6″.05=24.2 square inches.
Weight, 37½ pounds=133.9 pounds per cubic foot.
Gauged length, 9″.98.

Applied loads.		Compression.	Successive compression.	Set.	Remarks.
Total.	Per square inch.				
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	
2, 420	100	0.	0.	0.	Initial load.
24, 200	1, 000	.0121	.0121	.0041	
24, 200	1, 000	.0127	.0006	.0046	
48, 400	2, 000	.0195	.0068	.0052	
48, 400	2, 000	.0195	0.	.0058	
72, 600	3, 000	.0253	.0058	.0061	
72, 600	3, 000	.0253	0.	.0064	
96, 800	4, 000	.0309	.0056	.0071	
96, 800	4, 000	.0309	0.	.0074	
24, 200	1, 000	.0151	.0077	....	E=1, 166, 500.
48, 400	2, 000	.0209	.0058	....	E=1, 720, 700.
72, 600	3, 000	.0263	.0054	....	E=1, 848, 100.
96, 800	4, 000	.0312	.0049	....	E=2, 036, 700.
72, 600	3, 000	.0275	.0037	....	E=2, 697, 300.
48, 400	2, 000	.0226	.0049	....	E=2, 036, 700.
24, 200	1, 000	.0172	.0054	....	E=1, 848, 100.
2, 420	100	.0076	.0096	....	E= 985, 630.
121, 000	5, 000	.0364	.0288	.0081	
121, 000	5, 000	.0367	.0003	.0085	
145, 200	6, 000	.0420	.0053	.0090	
145, 200	6, 000	.0428	.0008	.0098	
169, 400	7, 000	.0518	.0090	.0108	

Test discontinued.
Cracks started at ends near the corners.

No. 1295.

Compression test.

GRANITE, WORCESTER QUARRY.

Length, 20.″06.
Sectional area, 4″.09 × 6″.07 = 24.83 square inches.
Weight, 46¾ pounds = 155.9 pounds per cubic foot.
Gauged length, 9″.86.

Applied loads.		Compression.	Successive compression	Set.	Remarks.
Total.	Per square inch.				
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	
2, 483	100	0.	0.	0.	Initial load.
24, 830	1, 000	.0037	.0037	.0007	
24, 830	1, 000	.0037	0.	.0007	
49, 660	2, 000	.0066	.0029	.0010	
49, 660	2, 000	.0066	0.	.0007	
74, 490	3, 000	.0088	.0022	.0013	
99, 320	4, 000	.0110	.0022	.0015	
124, 150	5, 000	.0128	.0018	.0016	
24, 830	1, 000	.0045	.0029	....	
49, 660	2, 000	.0070	.0025	....	
74, 490	3, 000	.0090	.0020	....	
99, 320	4, 000	.0110	.0020	....	
124, 150	5, 000	.0130	.0020	....	
99, 320	4, 000	.0114	.0016	....	
74, 490	3, 000	.0097	.0017	....	
49, 660	2, 000	.0080	.0017	....	
24, 830	1, 000	.0046	.0034	.0016	
148, 980	6, 000	.0144	.0098	.0016	
173, 810	7, 000	.0161	.0017	.0016	
198, 640	8, 000	.0176	.0015	.0017	
223, 470	9, 000	.0194	.0018	.0019	
198, 640	8, 000	.0178	.0016	....	
198, 640	8, 000	.0179	.0001	.0020	After remaining under load one hour.
248, 300	10, 000	.0206	.0027	.0019	
24, 830	1, 000	.0051	.0032	....	E=2, 773, 100.
49, 660	2, 000	.0076	.0025	....	E=3, 994, 000.
74, 490	3, 000	.0096	.0020	....	E=4, 930, 000.
99, 320	4, 000	.0114	.0018	....	E=5, 447, 780.
124, 150	5, 000	.0131	.0017	....	E=5, 800, 000.
148, 980	6, 000	.0144	.0013	....	E=7, 584, 600.
173. 810	7, 000	.0163	.0019	....	E=5, 189, 500.
198, 640	8, 000	.0177	.0014	....	E=7, 042, 800.
223, 470	9, 000	.0192	.0015	....	E=6, 573, 300.
248, 300	10, 000	.0206	.0014	....	E=7, 042, 800.
223, 470	9, 000	.0195	.0011	....	E=8, 963, 600.
198, 640	8, 000	.0181	.0014	....	E=7, 042, 800.
173, 810	7, 000	.0168	.0013	....	E=7, 584, 600.
148, 980	6, 000	.0155	.0013	....	E=7, 584, 600.
124, 150	5, 000	.0140	.0015	....	E=6, 573, 300.
99, 320	4, 000	.0124	.0016	....	E=6, 162, 500.
74, 490	3, 000	.0106	.0018	....	E=5, 447, 780.
49, 660	2, 000	.0088	.0018	....	E=5, 447, 780.
24, 830	1, 000	.0063	.0025	....	E=3, 944, 000.
2, 483	100	.0020	.0043	....	E=2, 063, 700.

Test discontinued.

Transverse tests.

Ends supported 18″ apart.
Loaded at the middle.

No. of test.	Name of stone.	Dimensions.		Ultimate strength.	
		Breadth.	Depth.	Total.	Modulus of rupture R.
		Inches.	*Inches.*	*Pounds.*	
33	Sandstone, Worcester quarry	4.00	5.99	5,420	1,020
34	Sandstone, Kibbe quarry	3.99	6.03	5,885	1,095
35	Sandstone, Ohio	4.00	6.05	2,845	525
36	Granite, Worcester quarry	4.00	6.07	7,290	1,334

Formula for transverse tests, rectangular sections, $R=\frac{3\,pl}{2\,bd^2}$

RESISTANCE OF BANDED SHELL DRAWN THROUGH THE BORE OF 3.2-INCH RIFLED GUN.

Shell.

Exterior diameter of shell	inches	3.18
Exterior diameter of copper band	do	3.304
Length of copper band	do	.50
Length of copper band exclusive of chamfer	do	.46

3.2-*inch rifle No.* 1.

Diameter of bore	inches	3.2
Diameter bottom of grooves	do	3.3
Width of grooves	do	0.3
Width of lands	do	0.1188
Number of grooves	do	24
Length of rifling	do	71.53

Twist of rifling, 1 turn in 30 calibers.

Area of base of shell including band, 8.55 square inches. Shearing area of copper band (″.05+″.1188+″.05)×″.50×24=2.626 square inches.

The fixtures employed consisted of a rod tapped into the point of the shell; the opposite end of the rod connected with the piston of an hydraulic cylinder, the latter to allow the shell to follow the twist of the rifling.

A total load of 55,200 pounds was applied to the fixture, which was secured to the shell.

At this load the wrought-iron bar which was tapped into point of shell fractured, and the test was discontinued.

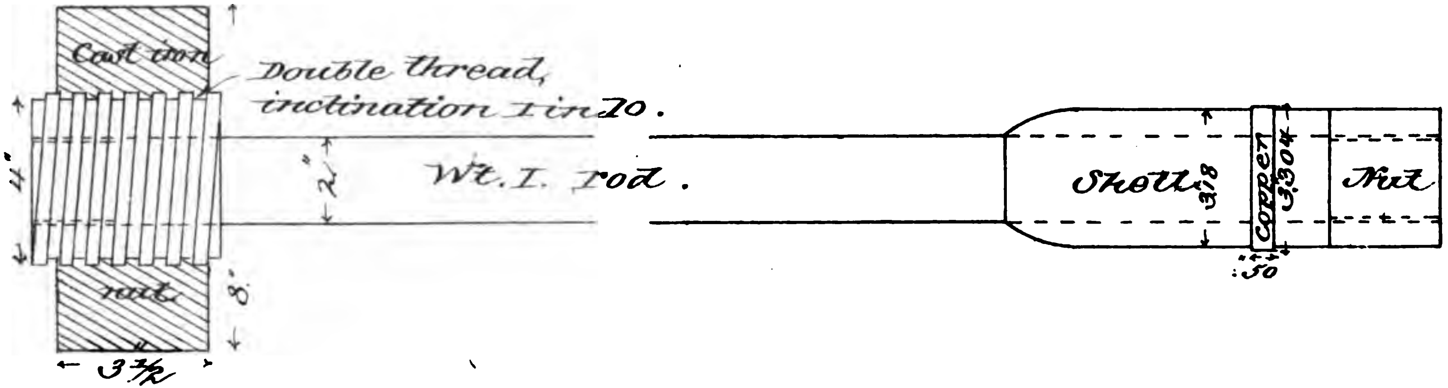
The shell entered the rifling a total distance of ″.29 measured to the end of the chamfer of the lands, or ″.14 of the band entered to the full depth of the lands.

New fixtures were now provided for drawing the shell, employing a larger rod, which passed through the shell and had a nut over the end. At the other end of this rod was provided a nut with coarse pitch (inclination of thread 1 in 10), which allowed the rod and shell to turn, while the latter followed the twist of the rifling of the gun.

New shell employed.

Bore of gun well greased.

Fixture for drawing banded shell through the bore of a 3.2 inch rifle.



Resistance.	Distance shell traveled.	Time.		Remarks.
		Actual.	Reduced.	
Pounds.	*Inches.*	*h. m.*	*m.*	
5,000	0.	3 42	0	Initial load.
20,000	.06	42½	½	
30,000	.09	43	1	
40,000	.13	44	2	
50,000	.19	44½	2½	
60,000	.32	45	3	
60,800	....	....	....	Maximum resistance=7,110 pounds per square inch on base of shell and band, and 23,150 pounds per square inch shearing resistance of copper band.
23,000	.70	46	4	
19,200	1.00	47	5	
13,700	4.00	48	6	
13,600	5.00	49	7	
12,900	6.00	49¼	7¼	
12,700	7.00	49½	7½	
11,900	8.00	50	8	
12,000	9.00	50¼	8¼	
13,000	10.00	50½	8½	
11,200	18.25	4 5	23	After 14½ minutes rest.

The resistance of the shell gradually decreased to 9,000 pounds when it reached the muzzle of the gun.

Small pieces of the copper band ''.2 diameter by ''.04 thick were sheared off by the lands, and remained behind in the gun. The band filled the grooves and the fixtures gave the shell freedom to turn and follow the rifling.

The shell was fitted with a new copper band and again forced through the bore of the gun, employing the same fixtures as in the preceding experiment.

Bore of gun not greased.

Resistance.	Distance shell traveled.	Time.		Remarks.
		Actual.	Reduced.	
Pounds.	*Inches.*	*h. m.*	*m.*	
5,000	0.	11 08	0	Initial load.
20,000	.06	8½	½	
30,000	.09	9	1	
40,000	.14	9½	1½	
63,700	.36	10	2	Maximum resistance=7,450 pounds per square inch on base of shell and band, and 24,260 pounds per square inch shearing resistance of copper band.
21,600	1.00	11	3	
17,000	2.00	11½	3½	
16,200	3.00	12	4	
14,500	4.00	12¼	4¼	
13,100	5.00	12½	4½	
13,100	6.00	13	5	
13,000	7.00	13½	5½	

The movement of the shell was continued at the rate of about 5 inches per minute for the remainder of the test, with the exception of intermissions of five minutes each, when new strokes of the testing machine piston were obtained. This rest temporarily increased the resistance of the shell in the gun about 2,000 pounds.

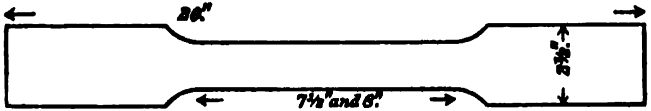
The resistance from the load last recorded in the table gradually decreased to about 9,000 pounds at the close of the test; the absence of the grease which was in the gun when the shell was first forced through not materially changing the resistance.

Small pieces of copper were sheared from the band by the lands of the gun, as noted in the prior test.

STEEL PLATE.

[Steel plate specimens from Lieut. Col. A. R. Buffington, Ordnance Department, U. S. Army, National Armory.]

Form of specimens.



Test number.	Mark on specimen.	Dimensions. Width.	Dimensions. Thickness.	Sectional area.	Elastic limit. Total.	Elastic limit. Per square inch.	Ultimate strength. Total.	Ultimate strength. Per square inch.	Elongation in 7 inches. Inches.	Elongation in 7 inches. Per cent.	Area at fracture.	Contraction of area.	Appearance of fracture.	Elongation of 1-inch sections.
		Inches.	*Inches.*	*Sq. in.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*			*Inches* *Sq. in.*	*Per ct.*		
1001	1	1.502	.254	.382	20,040	52,460	27,120	70,990	1.92	27.4	1.17×.18=.211	44.8	Silky	".18, ".23, ".56*, ".27, ".26, ".22, ".20
1002	2	1.505	.255	.384	20,400	53,130	27,460	71,510	1.87	26.7	1.16×.17=.197	48.7	Silky, slightly lamellar.	.20, .18, .21, .31, .55*, .24, .18.
1003	3	1.503	.252	.379	19,280	50,870	26,560	70,080	1.83	26.1	1.18×.19=.224	40.9	Silky, seamy	.20, .22, .40*, .42*, .23, .20, .16.
1004	4	1.505	.252	.379	18,990	50,100	26,690	70,420	1.64	23.4	1.19=.17=.202	46.7	....do	".55*, .24, .18, .16, .18, .17, .16.

Test number.	Mark on specimen.	Dimensions. Width.	Dimensions. Thickness.	Sectional area.	Elastic limit. Total.	Elastic limit. Per square inch.	Ultimate strength. Total.	Ultimate strength. Per square inch.	Elongation in 8 inches. Inches.	Elongation in 8 inches. Per cent.	Area at fracture.	Contraction of area.	Appearance of fracture.	Elongation of 1-inch sections.
		Inches.	*Inches.*	*Sq. in.*	*Pounds.*	*Pounds.*	*Pounds*	*Pounds.*			*Inches.* *Sq. in.*	*Per ct.*		
1033	1	1.498	.283	.424	24,250	57,190	30,580	72,120	1.88	23.5	1.18×.18=.212	50.0	Silky	".14, ".23, ".56*, ".26, ".20, ".19, ".17, ".18.
1034	2	1.495	.255	.381	19,980	52,440	29,010	76,140	1.82	22.8	1.17×.18=.211	44.6	....do	.18, .18, .22, .55*, .24, .20, .17, .18.
1035	3	1.493	.252	.376	17,950	47,740	26,100	69,420	1.97	24.6	1.16×.16=.186	50.5	....do	.16, .22, .35 .49*, .23, .17, .19, .16.
1036	4	1.495	.257	.384	17,840	46,460	26,380	68,700	1.93	24.1	1.15×.17=.196	49.0	Silky, slight lamination.	.20, .57*, .21, .19, .22, .20, .19, .15.
1037	5	1.500	.255	.383	19,700	51,440	27,390	71,510	2.03	25.4	1.16×.18=.209	45.4	Silky	.16, .27, .56*, .26, .23, .21, .19, .15.
1038	6	1.498	.261	.389	18,480	47,510	29,090	74,780	1.77	22.1	1.18×.19=.224	42.4	... do	.14, .47*, .26, .17, .18, .20, .20, .15.
1039	7	1.504	.256	.385	17,030	44,230	26,050	67,660	1.99	24.9	1.17×.16=.187	51.4	....do	.16, 19, .24, .56*, .25, .28, .21, .16.
1040	8	1.498	.269	.403	17,260	42,830	27,360	67,890	2.04	25.5	1.15×.17=.196	51.4	Silky, lamellar	.18, .20, .23, .24, [illegible], .24, .23, .18.
1041	9	1.500	.257	.386	18,320	47,400	26,910	69,500	1.88	23.5	1.17×.17=.199	48.4	Silky	.26, .47*, .17, .21, .26, .21, .17, .13.

1042	10	1.505	.265	.384	18,100	47,140	26,790	69,770	1.91	23.9	1.17×.17=.199	48.2	....do	.18, .19. .21, .56*, .23, .20, .22, .17.
1043	11	1.498	.267	.385	18,450	47,920	28,720	74,600	1.83	22.9	1.20×.18=.216	43.9	....do	.17, .24 .36, .42*, .21, .17, .15, .11.
1044	12	1.494	.264	.379	17,200	45,380	26,090	68,840	2.02	25.2	1.17×.16=.187	50.7	Silky, slight lamination.	.18, .29, .51*, .19, .20, .24, .24, .17.
1045	13	1.500	.259	.389	18,070	45,820	26,920	69,200	2.09	26.1	1.19×.15=.179	54.0	Silky	.16, .22, .20, .20, .23, .58*, .31, .19.
1046	14	1.501	.253	.380	17,880	45,740	26,270	69,180	2.02	25.2	1.16×.17=.197	48.2	Silky, slight lamination.	.17, .26, .59*, .23, .18, .19, .22, .18.
1047	15	1.500	.256	.384	18,250	47,530	26,220	68,280	1.93	24.1	1.17×.17=.199	48.2	Silky	.19, .30, .52*, .20, .18, .19, .20, .15.
1048	16	1.492	.256	.382	18,160	47,540	25,950	67,930	1.68	21.0	1.19×.16=.190	50.3	Silky, slight lamination.	.16, .34*, .38*, .18, .16, .16, .16, .14.
1049	17	1.500	.268	.402	18,600	46,270	28,040	69,750	1.81	22.6	1.16×.19=.220	45.8	Silky	.14, .21, .55*, .28, .17, .17, .16, .13.
1050	18	1.499	.267	.400	18,850	47,130	27,460	68,650	1.91	23.9	1.16×.18=.209	47.8	Silky, slight lamination.	.17, .26, .57*, .23, .19, .17, .17, .15.
1051	19	1.501	.262	.393	18,800	47,840	28,020	71,300	1.99	24.9	1.20×.15=.180	54.2	Silky	.18, .26, .56*, .26, .22, .20, .17, .14.
1052	20	1.497	.262	.392	18,040	46,020	26,800	68,370	2.07	25.9	1.16×.15=.174	55.6	....do	.16, .22, .21, .23, .57*, .31, .21, .16
1053	21	1.502	.258	.388	20,200	52,060	29,260	75,410	1.70	21.2	1.26×.16=.202	47.9	....do	.16, .18, .22, .47*, .19, .17, .18, .13.
1054	22	1.500	.259	.389	18,580	47,760	26,620	68,430	1.89	23.6	1.16×.18=.209	46.3	....do	.18, .47*, .33, .19, .19, .18, .19, .16.
1055	23	1.500	.259	.389	17,940	46,120	26,710	68,660	1.98	24.7	1.15×.17=.196	49.6	...do	.16, .16, .18, .20, .26, .56*, .28, .18.
1056	24	1.500	.265	.398	19,750	49,620	28,580	71,810	1.82	22.8	1.17×.19=.222	44.2	....do	.17, .25, .52*, .23, .19, .17, .16, .13.
1057	25	1.499	.267	.400	19,620	49,050	28,290	70,720	1.83	22.9	1.18×.16=.189	52.8	....do	.16, .32, .45, .19, .18, .17, .18, .18.
1058	1.	1.504	.274	.412	20,680	50,190	29,080	70,580	1.73	21.6	1.18×.18=.212	48.5	Silky, lamellar	.13, .19, .55*, .23, .18, .15, .18, .12.
1059	2.	1.500	.262	.393	18,970	48,270	27,080	68,910	2.08	26.0	1.16×.18=.209	46.8	Silky, slightly lamellar.	.15, .21, .22, .23, .21, .26, .59*, .21.
1060	3.	1.497	.266	.398	19,850	49,870	28,320	71,160	1.90	23.7	1.17×.19=.222	44.2	Silky	.17, .20, .34, .48*, .22, .20, .17, .12.
1061	4.	1.506	.257	.387	18,270	47,210	25,920	66,980	2.13	26.6	1.15×.17=.196	49.4	....do	.17, .20, .22, .27, .58*, .29, .26, .14.
1062	5.	1.495	.261	.390	22,800	58,460	32,190	82,540	1.84	23.0	1.17×.17=.199	49.0	....do	.18, .16, .20, .23, 54*, .22, .22, .14.
1063	6.	1.507	.265	.399	18,220	45,660	27,260	68,320	2.23	27.9	1.15×.18=.207	48.1	....do	.18, .24, .26, .26, .60*, .29, .25, .15.
1064	7.	1.506	.255	.384	25,650	66,800	39,040	101,660	1.43	17.9	1.18×.21=.248	35.4	....do	.11, .15, .16, .17, .18, .24, .31*, .11.
1065	8.	1.515	.255	.386	17,700	45,850	25,440	65,910	2.01	25.1	1.17×.16=.187	51.6	Silky, lamellar	.17, .22, .59*, .24, .24, .23, .19, .13.
1066	9.	1.494	.260	.388	21,100	54,380	30,490	78,580	1.65	20.6	1.17×.18=.211	45.6	Silky	.17, .51*, .20, .18, .16, .16, .14, .13.
1067	10.	1.519	.263	.399	19,750	49,500	28,720	71,980	1.87	23.4	1.17×.18=.211	47.1	....do	.17, .54*, .23, .22, .20, .18, .17, .16.
1068	11.	1.510	.264	.399	16,960	42,510	25,860	64,810	2.01	25.1	1.16×.18=.209	47.6	....do	.20, .42*, .45*, .26, .20, .18, .17, .13.
1069	12.	1.500	.260	.390	18,920	48,510	27,190	69,720	2.17	27.1	1.15×.18=.207	46.9	....do	.18, .30, .55*, .26, .24, .27, .22, .15.
1070	13.	1.506	.253	.381	18,350	48,160	26,250	68,900	2.02	25.2	1.16×.17=.197	48.3	Silky, slightly, lamellar.	.21, .57*, .29, .23, .21, .20, .17, .14.
1071	14.	1.495	.260	.389	18,960	48,740	28,090	72,210	1.74	21.7	1.20×.17=.204	47.6	....do	.14, .16, .17, .16, .49*, .26, .20, .16.
1072	15.	1.499	.260	.390	18,200	46,670	27,200	69,740	1.78	22.2	1.28×.21= 269	31.0	....do	.15, .19, .23, .24, .23, .36*, .23, .15.
1073	16.	1.511	.255	.393	17,450	44,400	26,810	66,950	1.89	23.6	1.17×.17=.199	49.4	....do	.13, .16, .14, .17, .22, .28, .59*, .20.
1074	17.	1.502	.254	.383	18,190	47,490	28,360	74,050	1.89	23.6	1.19×.18=.214	44.1	Silky	.16, .28, .48*, .25, .22, .19, .18, .13.
1075	18.	1.494	.254	.379	20,150	53,170	28,790	75,960	1 88	23.5	1.20×.18=.216	43.0	....do	.17, .34, .41*, .20, .20, .20, .21, .15.
1076	19.	1.511	.256	.387	21,900	56,590	31,700	81,910	1.71	21.4	1.18×.18=.212	45.2	....do	.14, .18, .22, .52*, .20, .17, .16, .12.
1077	20.	1.502	.265	.398	18,920	47,540	27,460	69,000	1.88	23.5	1.16×.16=.186	53.3	... do	.17, .19, .16, .18, .19, .24, .57*, .18.
1078	21.	1.491	.260	.388	20,300	52,320	27,050	69,720	1.98	24.7	1.16×.17=.197	49.2	Silky, slightly lamellar.	.17, .24, .57*, .28, .21, .19, .17, .15.
1079	22.	1.502	.256	.385	17,800	46,230	26,280	68,260	1.92	21.0	1.16×.17=.197	48.8	....do	.15, .18, .20, .24, .22, .58*, .20, .15.
1080	23.	1.505	.252	.379	17,240	45,490	25,680	67,760	1.64	20.5	1.17×.16=.187	50.7	Silky	.13, .16, .14, .17, .17, .21, .51*, .15.
1081	24.	1.505	.255	.384	18,820	49,010	27,710	72,160	1.75	21.9	1.18×.17=.201	47.7	....do	.19, .58*, .21, .18, .17, .16, .18, .13.
1082	25.	1.505	.260	.391	18,100	46,290	26,290	67,240	1.83	22.9	1.15×.16=.184	52.9	Silky, slightly lamellar.	.14, .18, .16, .18, .21, .51*, .29, .16.

Specimen 15. fractured at marks stamped on specimen.

STEEL PLATE FOR 5-INCH SIEGE CARRIAGE.

[Specimens 19″ to 24″ long × 1″ wide.]

Test number.	Mark on specimen.	Dimensions.		Sectional area.	Elastic limit.		Ultimate strength.		Elongation in 8 inches.		Area at fracture.	Contraction of area.	Appearance of fracture.	Elongation of 1-inch sections.							
		Width.	Thickness.		Total.	Per square inch.	Total.	Per square inch.													
		Inches.	*Inch.*	*Sq. in.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds*	*Inches.*	*P. ct.*	″ ″ □″	*Per ct.*		″	″	″	″	″	″	″	″
1312	•	1.015	.500	.507	18,860	37,200	30,260	59,680	1.74	21.8	.71×.31=.220	56.6	Silky	.47*,	.19,	.17,	.20,	.20,	.18,	.17,	.16
1313	• •	.995	.495	.493	16,980	34,440	29,240	59,310	1.67	20.9	.68×.31=.211	57.2	....do	.26,	.25,	.23,	.20,	.19,	.20,	.17,	.17
1314	• • •	1.020	.509	.519	17,100	32,950	28,880	55,650	1.18	14.8	.75×.34=.255	50.8	Silky, lamellar	.26,	.18,	.15,	.12,	.11,	.11,	.11,	.14
1315	• • • •	1.020	.517	.527	17,150	32,540	29,010	55,050	1.61	20.1	.73×.33=.241	54.3	....do	.29,	.25,	.20,	.18,	.16,	.16,	.17,	.20
1316	• • • • •	1.042	.367	.382	12,980	33,980	21,860	57,220	2.24	28.0	.86×.27=.232	39.2	Silky	.25,	.48*,	.38,	.27,	.25,	.23,	.25,	.13
1317	ı ı ı	1.040	.367	.382	12,650	33,120	21,480	56,230	1.28	16.0	.88×.29=.255	33.2	Silky; fractured at blister.	.31,	.15,	.14,	.13,	.13,	.14,	.15,	.15
1318	.•.•.•.	1.041	.365	.380	12,250	32,240	21,760	57,260	1.66	20.8	.74×.20=.148	61.1	Silky	.20,	.22,	.25,	.26,	.20,	.20,	.17,	.16
1319	ı ı ı ı	1.037	.364	.377	12,200	32,360	21,610	57,320	1.67	20.9	.74×.21=.155	58.8	... do	.30,	.23,	.23,	.21,	.20,	.17,	.16,	.17
1320	|	1.046	.251	.263	12,640	48,060	16,920	64,330	1.55	19.4	.83×.17=.141	46.4	Silky; slight lamination.	.30,	.38*,	.19,	.18,	.14,	.13,	.10,	.18
1321	| |	1.035	.251	.260	12,900	49,620	17,280	66,460	1.50	18.8	.84×.18=.151	41.9	Silky	.22,	.44*,	.14,	.16,	.16,	.13,	.14,	.11
1322	| | |	1.017	.500	.508	16,460	32,400	28,820	56,730	2.12	26.5	.78×.36=.281	44.7	....do	,54*,	.31,	.25,	.23,	.21,	.20,	.19,	.19
1323	| | | |	1.020	.505	.515	17,580	34,140	28,100	54,560	2.14	26.8	.75×.34=.255	50.5	....do	.28,	.55*,	.33,	.21,	.20,	.20,	.17,	.20
1324	⊓⊔⊓⊔	1.035	.500	.518	18,400	35,520	28,120	54,290	2.43	30.4	.77×.35=.270	47.9	....do	.26,	.58*,	.30,	.27,	.26,	.24,	.26,	.26
1325	⊓⊔⊓⊔ |	1.015	.500	.508	16,850	33,170	27,840	54,800	1.43	17.9	.79×.36=.284	44.1	....do	.32,	.20,	.18,	.16,	.14,	.16,	.14,	.13
1326	⊓⊔⊓⊔ | |	1.000	.500	.500	17,320	34,640	27,040	54,080	1.48	18.5	.73×.33=.241	51.8	....do	.28,	.22,	.18,	.18,	.16,	.17,	.14,	,15

WROUGHT-IRON PLATE.

[Worught-iron boiler plate from Frankford Arsenal, Pa.]

Form of specimens.

Test number.	Mark on specimen.	Dimensions.		Sectional area.	Elastic limit.		Ultimate strength.		Elongation in 10 inches.		Area at fracture.	Contraction of area.	Appearance of fracture.	Elongation of 1-inch sections.
		Width.	Thickness.		Total.	Per square inch.	Total.	Per square inch.						
		Inches.	*Inch.*	*Sq. in.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Inches.*	*P. ct.*	" " □"	*Per ct.*		" " " " " " " " " "
961	1	1.495	.433	.647	21, 300	32, 920	32, 960	50, 950	1.43	14.3	1.33×.35=.466	27.9	Fibrous, lamellar. seamy.	.11, .11, .14, .11, .11, .35*, .14, .12, .11, .13
962	2	1.497	.433	.648	24, 350	37, 580	24, 220	52, 810	.62	6.2	1.33×.34=.452	30.2	Fibrous, lamellar; broke at cinder spot.	.06, .06, .07, .07, .06, .08, .08, .07, .05, .02
963	3	1.495	.433	.647	24, 400	37, 710	35, 380	54, 680	1.28	12.8	1.33×.35=.466	27.9	Fibrous, lamellar, seamy.	.03, .05, .05, .09, .10, .16, .40*, .16, .12, .12
964	4	1.495	.436	.652	23, 200	35, 580	35, 060	53, 770	1.41	14.1	1.36×.36=.490	24.8	Fibrous, lamellar.	.09, .13, [illegible]1, .10, .11, .11, .13, .11, .19, .33*
965	5	1.494	.424	.633	21, 900	34, 600	32, 880	51, 940	.88	8.8	1.40×.38=.532	15.9	Fibrous, lamellar, seamy.	.07, .06, .06, .07, .06, .07, .08, .06, .25*, .10
966	6	1.498	.430	.644	20, 200	31, 370	33, 510	52, 030	1.47	14.7	1.34×.36=.482	25.1	....do	.06, .09, .09, .10, .12, .13, .14, .16, .19, .39*

TENSILE TESTS OF SPECIMENS OF WROUGHT IRON FROM WATERTOWN ARSENAL.

No. 1123.

Length, 35″.85.
Sectional area, 3″.32×1″.47=4″.88 square inches.
Elastic limit, 110,500 pounds=22,640 pounds per square inch.
Tensile strength, 206,700 pounds=42,360 pounds per square inch.
Elongation in 8 inches, 2″.82=35.2 per cent.
Area at fracture, 2″.25×″.91=2.05 square inches. Contraction, 58 per cent.
Elongation of inch sections: 1″, ″.55, ″.27, ″.20, ″.20, ″.18, ″.20, ″.23.
Appearance of fracture, fibrous.

No. 1124.

Length, 35″.80.
Sectional area, 2″.66×1″.42=3″.78.
Elastic limit, 118,000 pounds=31,220 pounds per square inch.
Tensile strength, 189,200 pounds=50,050 pounds per square inch.
Elongation in 8 inches, ″.86=10.8 per cent.
Area at fracture, 2″.31×1″.26=2.91 square inches. Contraction, 23 per cent.
Elongation of inch sections: ″.12, ″.12, ″.13, ″.10, ″.10, ″.11, ″.09, ″.09.
Tore apart from one face 5½″ outside the gauged length, at face of holder jaws.
Appearance of fracture, fibrous.

No. 1361.

Sample of metal drawn down from bar No. 1123 to the following dimensions:
Length, 36⅜″.
Sectional area, 1.″24×1″=1.24 square inches.
Elastic limit, 34,550 pounds=27,860 pounds per square inch.
Tensile strength, 58,780 pounds=47,400 pounds per square inch.
Elongation, 2″.06 in 8 inches=25.7 per cent.
Area at fracture, ″.90×″.68=.612 square inch. Contraction, 50.6 per cent.
Elongation of inch sections: ″.20, ″.18, ″.62*, ″.36, ″.19, ″.19, ″.15, ″.17.
Appearance of fracture, fibrous.

No. 1365.

Sample of Norway iron for 5-inch siege carriage:
Total length, 30¼″.
Sectional area, 1″.10×1″.11=1.221 square inches.
Elastic limit, 29,550 pounds=24,200 pounds per square inch.
Tensile strength, 52,680 pounds=43,145 pounds per square inch.
Elongation in 8 inches, 2″.68=33.5 per cent.
Area at fracture, ″.65×″.67=.436 square inch. Contraction of area, 64.3 per cent.
Appearance of fracture, fibrous.
Elongation of inch sections: ″.22, ″.23, ″.22, ″.22, ″.27, ″.79*, ″.50, ″.23.

WROUGHT-IRON AND STEEL BARS.

WROUGHT IRON.

No. 3071.

Total length, 4″.5.
Length of stem, 2″.
Mark, B.
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000450	.000200	0.	....	
5,000	20,000	.000650	.000200	0.	....	
6,250	25,000	.000800	.000150	0.	....	
7,500	30,000	.001050	.000250	0.	....	
7,750	31,000	.001100	.000050	....	....	
8,000	32,000	.001100	0.	....	....	
8,250	33,000	.001150	.000050	....	....	Elastic limit.
8,500	34,000	.007250	.006100	....	....	
8,750	35,000	.024750	.017500	....	....	
9,000	36,000	.026750	.002000	....	....	
9,250	37,000	.029100	.002350	....	....	
9,500	38,000	.032100	.003000	....	....	
9,750	39,000	.035100	.003000	....	....	
10,000	40,000	.040050	.004950	....	....	
10,250	41,000	.044000	.003950	....	....	
10,500	42,000	.049500	.005500	....	....	
10,750	43,000	.053500	.004000	....	....	
11,000	44,000	.059800	.006300	....	....	
11,250	45,000	.065250	.005450	....	....	
11,500	46,000	.073500	.008250	....	....	
11,750	47,000	.082250	.008750	....	....	
12,000	48,000	.09000	.007750	....	....	
12,250	49,000	.10250	.0125	....	....	
12,500	50,000	.11750	.0150	....	....	
12,750	51,000	.1400	.0225	....	....	
12,960	51,840	.2250	.0850	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	51,840
Elastic limit per square inch of original section	do	33,000
Elongation per inch after rupture	inch	0.3300
Elongation per inch under strain at elastic limit	do	.001150
Reduction in diameter at point of rupture	do	.123
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		at middle of stem
Character of broken surface		fibrous, seamy
Elongation of inch sections		″.33*, ′.33*

WROUGHT IRON.

No. 3072.

Total length, 4″.5.
Length of stem, 2″.
Mark, N.
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000150	.000150	0.	....	
2, 500	10, 000	.000350	.000200	0.	....	
3, 750	15, 000	.000500	.000150	0.	....	
5, 000	20, 000	.000650	.000150	0.	....	
6, 250	25, 000	.000900	.000250	.000050	.000050	
6, 500	26, 000	.001000	.000100	....	....	Elastic limit.
6, 750	27, 000	.001250	.000250	....	....	
7, 000	28, 000	.007750	.006500	....	....	
7, 250	29, 000	.015000	.007250	....	....	
7, 500	30, 000	.024000	.009000	....	....	
7, 750	31, 000	.034500	.010500	....	....	
8, 000	32, 000	.038500	.004000	....	....	
8, 250	33, 000	.041500	.003000	....	....	
8, 500	34, 000	.045000	.003500	....	....	
8, 750	35, 000	.049000	.004000	....	....	
9, 000	36, 000	.054900	.005900	....	....	
9, 250	37, 000	.060000	.005100	....	....	
9, 500	38, 000	.067250	.007250	....	....	
9, 750	39, 000	.073750	.006500	....	....	
10, 000	40, 000	.083500	.009750	....	....	
10, 250	41, 000	.0950	.0115	....	....	
10, 500	42, 000	.1050	.0100	....	....	
10, 750	43, 000	.1200	.0150	....	....	
11, 000	44, 000	.1400	.0200	....	....	
11, 250	45, 000	.1600	.0200	....	....	
11, 500	46, 000	.2100	.0500	....	....	
11, 550	46, 200	.2650	.0550	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	46, 200
Elastic limit per square inch of original section	do....	26, 000
Elongation per inch after rupture	inch..	0. 4500
Elongation per inch under strain at elastic limit	do....	.001000
Reduction in diameter at point of rupture	do....	.273
Reduction in area after rupture, per centum of original section		73. 6
Position of rupture		1″ from neck
Character of broken surface		fine fibrous
Elongation of inch sections		″.28, ″.62

TENSILE TESTS OF TWELVE BARS FOR THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

ROUND BARS, FINISHED.

No. of test.	Kind of metal.	Dimensions.		Sectional area.	Elastic limit.		Tensile strength.		Elongation in 8″.		Area at fracture.	Contraction.
		Total length.	Diameter.		Total.	Per square inch.	Total.	Per square inch.				
		Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Inch.*	*Per cent.*	*Inch.* *Sq. inch.*	*Per cent.*
967	Steel	17	.722	.409	....	....	33,200	81,170	.27	3.4	....	....
968	Steel	17	.724	.412	....	....	35,490	86,140	.59	7.4	.48 diameter=.181	56.1
969	Steel	17	.724	.412	....	....	34,540	83,840	.32	4.0	.50 diameter=.196	52.4
970	Iron	17	.721	.408	....	....	34,470	84,480	.31	3.9	.53 diameter=.221	45.8
971	Iron	17	.723	.411	....	....	35,720	86,910	.84	10.5	.56 diameter=.246	40.1
972	Iron	17	.723	.411	....	....	33,350	81,140	.29	3.6	.52 diameter=.212	48.4

No. of test.	Load at rupture.	Duration of test.	Appearance of fracture.	Elongation of inch sections.	Remarks.
	Pounds.	*Minutes.*		″ ″ ″ ″ ″ ″ ″ ″	
967	27,400	4	Silky	.03, .04, .02, .04, .04, .03, .04, .03	Fractured in jaws of machine, 2″.6 outside 8″ section.
968	27,600	4½	Silky	.08, .08, .06, .07, .07, .06, .08, .09	Fractured in jaws of machine, 1″.6 outside 8″ section.
969	25,500	4	Silky	.04, .05, .03, .05, .03, .04, .04, .04	Fractured in jaws of machine, 1″.25 outside 8″ section.
970	26,400	4½	Fibrous	.04, .04, .04, .05, .04, .03, .04, .03	
971	27,200	3½	Fibrous	.10, .37*, .10, .05, .07, .04, .06, .05	Fractured in jaws of machine, 2″.40 outside 8″ section.
972	24,900	3½	Fibrous	.04, .05, .03, .04, .03, .02, .04, .04	

TENSILE TESTS OF TWELVE BARS FOR THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Continued.

FLAT AND SQUARE BARS, ROUGH.

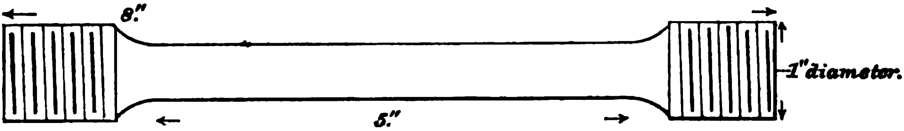
No. of test.	Kind of metal.	Dimensions.			Sectional area.	Elastic limit.		Tensile strength.		Elongation in 8".		Area at fracture.	Contraction.
		Total length.	Width.	Thickness.		Total.	Per square inch.	Total.	Per square inch.				
		Inches.	*Inches.*	*Inches.*	*Sq. inches.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Inches.*	*Per cent.*	*Inches.* *Sq. in.*	*Per cent.*
973	Steel	22	2.51	.52	1.31	48,100	36,700	75,080	57,310	2.66	33.3	1.89 ×.36 = .680	48.1
974	Steel	22	2.52	.50	1.26	46,500	36,900	67,900	53,890	2.63	32.9	1.92 ×.36 = .691	45.2
975	Steel	22	2.52	.52	1.31	47,700	36,410	74,530	56,890	2.39	29.9	2.01 ×.40 = .804	38.6
976	Steel	22.1	.99	.99	.980	33,200	33,880	50,050	51,090	1.68	21.1	.77 ×.84 = .647	34.0
977	Steel	21.9	.98	.99	.970	30,780	31,730	52,890	54,530	2.62	32.8	.67 ×.68 = .456	53.0
978	Steel	22.7	.99	.99	.980	32,350	33,010	51,410	52,460	2.68	33.5	.64 ×.65 = .416	57.5

No. of test.	Load at rupture.	Duration of test.	Appearance of fracture.	Elongation of inch sections.	Remarks.
	Pounds.	*Minutes.*		" " " " " " " "	
973	64,000	5	Silky	.26, .24, .28, .31, .77*, .32, .26, .28	Open at middle of fracture ".05 when sides meet.
974	61,000	4	Silky; broke at lap mark	.23, .33, .78*, .30, .29, .29, .24, .22	Open at middle of fracture ".15 when sides meet.
975	70,000	4½	do	.24, .24, .42*, .47*, .26, .29, .26, .21	Open at middle of fracture ".07 when sides meet.
976	48,000	4¾	Silky	.21, .17, .20, .30*, .26*, .19, .19, .16	
977	46,300	5	Silky	.27, .22, .25, .28, .32, .70*, .32, .26	
978	40,000	4½	Silky	.33, .77*, .32, .28, .26, .24, .24, .24	

STEEL FROM COL. A. R. BUFFINGTON, ORD. DEPT., U. S. A.

No. 1364.

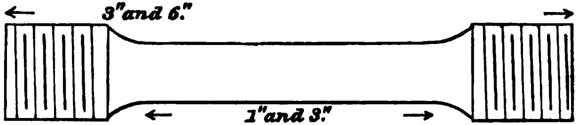
Form of specimen.



Diameter of stem, ″.565.
Sectional area, ″.25 square inch.
Elastic limit, 11,280 pounds=45,120 pounds per square inch.
Tensile strength, 15,260 pounds=61,040 pounds per square inch.
Elongation in 5 inches, 1″.40=28 per cent.
Diameter at fracture, ″.37. Area, ″.108 square inch. Contraction of area, 46.2 per cent.
Fractured 2″.30 from neck. Appearance fine, silky.
Elongation of inch section: ″.20, ″.52*, .″29, .″22, ″17.

TENSILE TESTS OF FIFTY MILD-STEEL SPECIMENS.

Form of specimens.



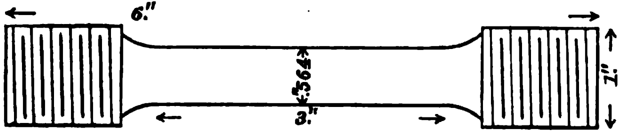
No. of test.	Mark on specimen.	Dimensions.	Sectional area.	Elastic limit.		Ultimate strength.		Elongation in 1 inch.		Area of fracture.	Contraction of area.	Appearance of fracture.	Elongation of inch sections.
				Total.	Per square inch.	Total.	Per square inch.						
		Inch.	*Sq. inch.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Inch.*	*Per cent.*	*Inch.* *Sq. inch.*	*Per ct.*		
1218	1	.505 diameter...	.20	11,250	56,250	18,420	92,100	.26	26	.40 diameter=.126	37.1	Silky, interspersed with fine granulation.	
1219	2	.505 ....do	.20	10,780	53,900	18,820	94,100	.27	27	.39 diameter=.119	40.3	Silky	
1220	3	.505 ....do	.20	10,420	52,100	18,080	90,400	.30	30	.38 diameter=.113	43.3	......do	
1221	4	.505 ....do	.20	10,700	53,500	18,760	93,800	.27	27	.39 diameter= 119	40.3	......do	
1222	5	.505 ....do	.20	10,040	50,200	17,990	89,950	.30	30	.38 diameter=.113	43.3	......do	
1223	6	.505 ....do	.20	10,550	52,750	18,100	90,500	.30	30	.38 diameter=.113	43.3	......do	
1224	7	.505 ....do	.20	10,360	51,800	18,690	93,450	.28	28	.39 diameter=.119	40.3	Silky, trace of granulation.	
1225	8	.505 ....do	.20	10,620	53,100	18,150	90,750	.29	29	.38 diameter=.113	43.3	Silky	
1226	9	.505 ....do	.20	11,600	58,000	18,660	93,300	.30	30	.38 diameter=.113	43.3	......do	
1227	10	.505 ....do	.20	10,600	53,000	18,490	92,450	.29	29	.38 diameter=.113	43.3	......do	
1228	11	.505 ... do	.20	10,640	53,200	17,920	89,600	.31	31	.37 diameter=.108	46.2	......do	
1229	12	.505 ....do	.20	11,010	55,050	18,400	92,000	.31	31	.38 diameter=.113	43.3	......do	
1230	13	.505 ....do	.20	9,610	48,050	17,840	89,200	.30	30	.38 diameter=.113	43.3	......do	
1231	14	.505 ....do	.20	9,520	47,600	17,740	88,700	.29	29	.38 diameter=.113	43.3	......do	
1232	15	.505 ....do	.20	10,480	52,400	18,420	92,100	.30	30	.38 diameter=.113	43.3	......do	
1233	16	.505 ....do	.20	11,020	55,100	17,920	89,600	.30	30	.37 diameter=.108	46.2	......do	
1234	17	.505 ....do	.20	9,900	49,500	18,380	91,900	.19	19	.44 diameter=.152	23.9	Silky, 40 per cent, granular, 60 per cent.	
1235	18	.505 ....do	.20	10,020	50,100	18,590	92,950	.28	28	.40 diameter=.126	37.1	Silky, trace of granulation.	
1236	19	.505 ....do	.20	10,780	53,900	18,310	91,550	.29	29	.38 diameter=.113	43.3	Silky	
1237	20	.505 ....do	.20	11,350	56,750	18,210	91,050	.31	31	.38 diameter=.113	43.3	......do	
1238	21	.505 ....do	.20	10,220	51,100	18,020	90,100	.29	29	.38 diameter=.113	43.3	......do	

1239	22	.505 ....do	.20	11, 300	56, 500	18, 720	93, 600	.28	28	.38 diameter=.113	43.3	......do	
1240	23	.505 ....do	.20	10, 700	53, 500	17, 660	88, 300	.30	30	.37 diameter=.108	46.2	......do	
1241	24	.565 ....do	.25	12, 400	49, 600	21, 420	85, 680	.63*a*	21	.42 diameter=.139	44.6	......do	".31*, ".20, ".12.
1242	25	.505 ....do	.20	8, 820	44, 100	16, 510	82, 550	.29	29	.39 diameter=.119	40.3	......do	
1243	1.	.505 ....do	.20	11, 580	57, 900	18, 960	94, 800	.26	26	.40 diameter=.126	37.1	......do	
1244	2.	.505 ....do	.20	10, 110	50, 550	18, 400	92, 000	.27	27	.40 diameter=.126	37.1	......do	
1245	3.	.505 ....do	.20	10, 890	54, 450	17, 740	88, 700	.31	31	.38 diameter=.113	43.3	......do	
1246	4.	.505 ....do	.20	11, 020	55, 100	17, 930	89, 650	.32	32	.38 diameter=.113	43.3	......do	
1247	5.	.505 ....do	.20	9, 890	49, 450	18, 240	91, 200	.29	29	.40 diameter=.126	37.1	......do	
1248	6.	.505 ....do	.20	11, 010	55, 050	18, 640	93, 200	.28	28	.39 diameter=.119	40.3	......do	
1249	7.	.505 ....do	.20	10, 920	54, 600	18, 730	93, 650	.29	29	.38 diameter=.113	43.3	......do	
1250	8.	.505 ....do	.20	10, 500	52, 500	17, 760	88, 800	.31	31	.38 diameter=.113	43.3	......do	
1251	9.	.505 ....do	.20	10, 820	54, 100	18, 520	92, 600	.29	29	.38 diameter=.113	43.3	......do	
1252	10.	.505 ....do	.20	12, 020	60, 100	19, 190	95, 950	.29	29	.39 diameter=.119	40.3	......do	
1253	11.	.505 ....do	.20	8, 890	44, 450	18, 120	90, 600	.28	28	.39 diameter=.119	40.3	......do	
1254	12.	.505 ....do	.20	9, 980	49, 900	17, 970	89, 850	.29	29	.38 diameter=.113	43.3	......do	
1255	13.	.505 ....do	.20	10, 700	53, 500	18, 100	90, 500	.29	29	.38 diameter=.113	43.3	......do	
1256	14.	.505 ....do	.20	9, 710	48, 550	18, 220	91, 100	.29	29	.39 diameter=.119	40.3	......do	
1257	15.	.505 ....do	.20	10, 380	51, 900	18, 610	93, 050	.26	26	.41 diameter=.132	34.0	Silky, trace of granulation.	
1258	16.	.505 ....do	.20	10, 980	54, 900	17, 810	89, 050	.32	32	.37 diameter=.108	46.2	Silky	
1259	17.	.505 ....do	.20	10, 980	54, 900	18, 390	91, 950	.29	29	.39 diameter=.119	40.3	......do	
1260	18.	.505 ....do	.20	10, 600	53, 000	18, 720	93, 6 0	.28	28	.40 diameter=.126	37.1	......do	
1261	19.	.505 ....do	.20	10, 170	50, 850	17, 910	89, 550	.28	28	.38 diameter=.113	43.3	......do	
1262	20.	.505 ....do	.20	9, 510	47, 550	17, 740	88, 700	.30	30	.38 diameter=.113	43.3	......do	
1263	21.	.505 ....do	.20	10, 390	51, 950	18, 530	92, 650	.28	28	.40 diameter=.126	37.1	......do	
1264	22.	.505 ....do	.20	10, 100	50, 500	19, 090	95, 450	.26	26	.41 diameter=.132	34.0	......do	
1265	23.	.505 ....do	.20	9, 890	49, 450	17, 880	89, 400	.30	30	.38 diameter=.113	43.3	......do	
1266	24.	.565 ....do	.25	13, 110	52, 440	23, 020	92, 080	.58*a*	19.3	.45 diameter=.159	36.4	......do	".11, ".17, ".30*.
1267	25.	.565 ....do	.25	11, 590	46, 360	21, 000	84, 000	.67*a*	22.3	.41 diameter=.132	47.2	......do	".11, ".33, ".23.

a Elongations measured in 3 inches.

STEEL SPECIMENS FROM 5-INCH SIEGE CARRIAGE.

Form of specimens.



No. of test.	Mark on specimen.	Dimensions.	Sectional area.	Elastic limit.		Ultimate strength.		Elongation in 8 inches.		Area of fracture.	Contraction of area.	Appearance of fracture.	Elongation of 1-inch sections.
				Total.	Per square inch.	Total.	Per square inch.						
		Inch.	*Sq. inch.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Inch.*	*Per cent.*	*Inch. Sq. inch.*	*Per ct.*		
1366	•	.564 diameter...	.25	9,840	39,360	17,390	69,560	.83	27.7	.38 diameter=.113	54.6	Fine silky	″.16, ″.47*, ″.20.
1367	••	.564 ....do	.25	9,490	37,960	17,460	69,840	.80	26.7	.39 diameter=.119	52.2	......do	″.16, ″.43, ″.21.

TENSILE TESTS OF ROUND STEEL WIRE.

Total length of sample, 56".

Two specimens tested. One tested as received, unannealed; one annealed by heating cherry red and gradually cooling in hot air.

Diameter of wire, ".0365.

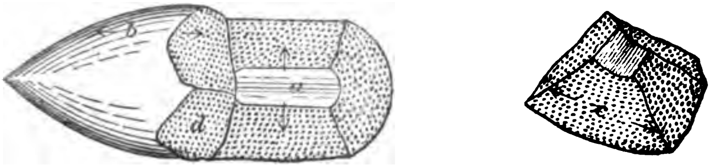
Sectional area, .001046 square inch.

Condition.	Tensile strength.		Area at fracture.		Contraction of area.
	Total.	Per square inch.	Diameter.	Area.	
	Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Per cent.*
Unannealed	338	323,140	.031	.000755	27.8
Annealed	147	140,540	.023	.000415	60.3

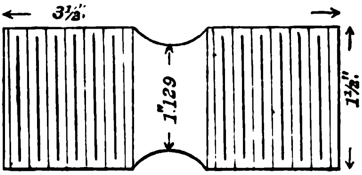
Appearance of fractures, fine, silky. Cup-shaped ends.

TENACITY TESTS OF CAST IRON FROM FRAGMENTS OF AN 8-INCH CORED SHOT WHICH BROKE UP DURING FIRING.

Sketch of principal fragments.



Form of specimens.



Number of test.	Marks.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inches.	*Sq. inch.*	*Pounds.*	*Pounds.*	
1125	*a*	1.129	1.00	28,700	28,700	Granular, mottled.
1126	*b*	1.129	1.00	29,500	29,500	Do.
1127	*c*	1.129	1.00	30,500	30,500	Do.

Specimen *a* contains small blow-holes ".04 diameter in the fractured surface.

NOTE.—The central part of the large fragment showed spongy metal in the fractured surface and beyond.

A piece located at *d* on the sketch was cut out, which contained a blow-hole 2"×2" by ".4 at the widest part. This largest blow-hole which was found began near the axis of the shot in front of the cored hole, and extended obliquely towards the cylindrical surface. The metal generally in this vicinity was spongy, particularly so at the bottom of the cored hole.

FORGING FOR PRESSURE GAUGE.

No. 3221.

Marks, $\overset{P\,G}{L_1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000867	.000200	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	0.	....	
10,000	40,000	.001367	.000167	0.	....	
11,250	45,000	.001533	.000166	....	....	
12,500	50,000	.001733	.000200	....	....	
13,750	55,000	.001900	.000167	....	....	
15,000	60,000	.002100	.000200	....	....	
16,250	65,000	.002267	.000167	....	....	
17,500	70,000	.002433	.000166	....	....	
18,750	75,000	.002567	.000134	....	....	
20,000	80,000	.002800	.000233	....	....	
20,250	81,000	.002833	.000033	....	....	
20,500	82,000	.002867	.000034	....	....	
20,750	83,000	.002900	.000033	....	....	
21,000	84,000	.002933	.000033	....	....	
21,250	85,000	.002967	.000034	....	....	
21,500	86,000	.003000	.000033	....	....	
21,750	87,000	.003033	.000033	....	....	
22,000	88,000	.003067	.000034	....	....	Elastic limit.
22,250	89,000	.003167	.000100	....	....	
22,500	90,000	.006100	.002933	....	....	
22,750	91,000	.006767	.000467	....	....	
23,000	92,000	.006900	.000333	....	....	
23,250	93,000	.007367	.000467	....	....	
23,500	94,000	.008000	.000633	....	....	
23,750	95,000	.008733	.000733	....	....	
24,000	96,000	.009433	.000700	....	....	
24,500	98,000	.010500	.001067	....	....	
25,000	100,000	.011833	.001333	....	....	
26,000	104,000	.0133	.001467	....	....	
27,000	108,000	.0150	.0017	....	....	
28,000	112,000	.0167	.0017	....	....	
29,000	116,000	.0200	.0033	....	....	
30,000	120,000	.0267	.0067	....	....	
31,000	124,000	.0300	.0033	....	....	
32,000	128,000	.0350	.0050	....	....	
33,000	132,000	.0400	.0050	....	....	
34,000	136,000	.0500	.0100	....	....	
35,000	140,000	.0767	.0267	....	....	
35,040	140,160	.0900	.0133	....	....	Tensile strength.
29,600	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8476
Hardness		25.62
Tensile strength per square inch of original section	pounds	140,160
Elastic limit per square inch of original section	do	88,000
Elongation per inch after rupture	inch	0.1367
Elongation per inch under strain at elastic limit	do	.003067
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.35 from neck
Character of broken surface		fine granular; silky center
Elongation of inch sections		″.07, ″.24, ″.10

No. 942.

TENACITY SPECIMEN FROM CASTING No. 31—12-INCH CAST-IRON SHELL.

Tensile strength, 26,150 pounds per square inch.
Appearance of fracture, uniform granular.

TENSILE TESTS OF PIECES OF ARTILLERY HARNESS FOR MAJ. E. B. WILLISTON, U. S. A.

No. 934.

Marked "All steel."
Thirteen links ″.85 long and ″.22 diameter of wire.
End ring 1″.05 diameter and ″.25 diameter of wire.
Under 3,280 pounds tension the end ring fractured.
Appearance of fracture, fine granular, radiating from a dull spot at the circumference at outside of ring.

Chain alone tested.

Under 3,260 pounds the middle link parted at weld, following the scarf.

No. 935.

Marked "Iron with steel ring."
Thirteen links ″.85 long and ″.21 diameter of wire.
End ring 1″.05 diameter and ″.25 diameter of wire.
Under 2,890 pounds tension end link of chain parted, following the scarf of the weld in part and in part through the sound metal.
Strength of the ring, 3,875 pounds.
Fractured across the wire at the weld.
Appearance of fracture, granular.

No. 936.

Light-colored leather trace.
Length, 11⅞″; 1″.50 wide by ″.42 thick.
Tensile strength, 2,875 pounds.

No. 937.

Consisting of a section of leather trace, with front end chain and toggle, and at other end a D ring.

Section of leather 13″ long by 1″.53 wide by ″.52 thick.

Front chain has 5 links 1″.4 long, made of wire ″.31 diameter. Attached to leather by a loop with three rivets in line, about 1″ apart each, beginning at 1″ from end of leather.

D ring made of wire ″.46 diameter.

Under 1,590 pounds tension the leather fractured at the inside rivet hole.

One end of leather now grasped in the testing machine, and opposite end held by D ring.

Under 2,720 pounds tension the leather parted 1½″ from jaws of testing machine and 5″ from the D ring.

Short end of leather again grasped, and opposite end held by the D ring.

Under 2,610 pounds tension the D ring tore out from the leather.

Strength of D ring, 5,970 pounds.

The ring bent over a link of ".67 diameter, and fractured at the angle of the D.

Appearance of metal, fibrous.

Strength of chain, 3,760 pounds.

Fractured the middle link at the weld. Appearance, fibrous.

HARNESS LEATHER.

Total length of strips, 20".

No. of test.	Dimensions.		Sectional area.	Tensile strength.		Elongation in 8 inches.		Remarks.
	Width.	Thickness.		Total.	Per square inch.			
	Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Inch.*	*Per ct.*	
1025	1.50	.225	.338	1,415	4,186	.22	2.7	Broke at face of grips.
1026	1.75	.22	.340	1,988	5,848	.56	7.0	Broke 1¼" from face of grips.
1027	2.00	.225	.450	1,960	4,356	.33	4.1	Broke 1" from face of grips.
1028	2.25	.225	.506	2,210	4,368	.23	2.9	Broke at face of grips.
1029	2.50	.22	.550	2,670	4,855	.60	7.5	Broke 1¼" from face of grips.

All the specimens but No. 1029 broke outside the 8-inch section.

Following are the details of the tests of Nos. 1027, 1028, and 1029:

No. 1027.

Applied loads.		Elongation in 8 inches.	Successive elongation.	Remarks.
Total.	Per square inch.			
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
100	....	.16	.16	
200	....	.34	.18	
300	....	.48	.14	
400	....	.60	.12	
500	....	.70	.10	
600	....	.90	.10	
700	....	.88	.08	
800	....	.97	.09	
900	....	1.08	.11	
1,000	....	1.19	.11	
1,100	....	1.30	.11	
1,200	....	1.38	.08	
1,300	....	1.48	.10	
1,400	....	1.55	.07	
1,500	....	1.65	.10	
1,600	....	1.77	.12	
1,700	....	1.86	.09	
1,800	....	1.96	.10	Cracks in outside surface.
1,900	....	2.04	.08	
1,960	4,356	....	....	Tensile strength.

No. 1028.

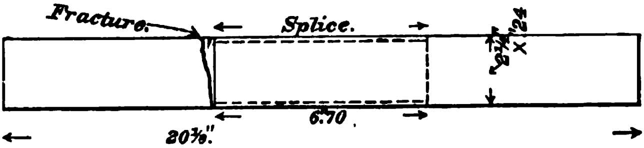
Applied loads.		Elongation in 8 inches.	Successive elongation.	Remarks.
Total.	Per square inch.			
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
100	....	.18	.18	
200	....	.32	.14	
300	....	.43	.11	
400	....	.54	.11	
500	....	.64	.10	
600	....	.71	.07	
700	....	.78	.07	
800	....	.87	.09	
900	....	.93	.06	
1,000	....	1.01	.08	
1,100	....	1.09	.08	
1,200	....	1.17	.08	
2,210	4,368	....	....	Tensile strength.

No. 1029.

Applied loads.		Elongation in 8 inches.	Successive elongation.	Remarks.
Total.	Per square inch.			
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
100	....	.14	.14	
200	....	.27	.13	
300	....	.38	.11	
400	....	.47	.09	
500	....	.56	.09	
600	....	.63	.07	
700	....	.70	.07	
800	....	.76	.06	
900	....	.84	.08	
1,000	....	.91	.07	".48 set under 100 pounds.
1,100	....	1.00	.09	
1,200	....	1.06	.06	
1,300	....	1.13	.07	
1,400	....	1.20	.07	
1,500	....	1.27	.07	
1,600	....	1.34	.07	
1,700	....	1.42	.08	
1,800	....	1.48	.06	
1,900	....	1.54	.06	
2,000	....	1.63	.09	".80 set under 100 pounds.
2,100	....	1.74	.11	
2,200	....	1.80	.06	
2,300	....	1.86	.06	
2,400	....	1.94	.08	Cracks appear in outside surface.
2,500	....	2.03	.09	
2,600	....	2.14	.11	
2,670	4,855	....	....	Tensile strength.

No. 1030.

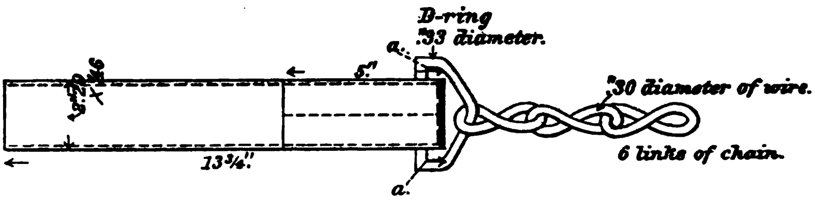
No. 1.—*HARNESS LEATHER LAP JOINT, SEWED.*



Ends gripped in holder jaws of machine.
Tensile strength, 1,525 pounds.
Broke at end of splice.

No. 1031.

No. 2.



Leather end gripped in holder jaws, chain end secured by wire loop passing through end link.

Tensile strength, 3,285 pounds.

Tore out D-ring from strap. Started cracks at inside angles of D-ring at *a a*.

Chain end held as before, D-ring held by a wire loop passing through it.

D-ring fractured at 2,340 pounds. Appearance of fracture, fibrous.

Tensile strength of chain, 6,180 pounds.

Fractured the third link at quarter weld. Appearance, fibrous.

The chain remained flexible up to the third test.

No. 1032.

No. 3.—Hemp rope 3⅝" circumference, 4' 8" long between thimble and ferrule, 4 strands, untarred.

One end of rope held in a thimble 6¾" long, one end in a ferrule 2".70 long with a conical screw within.

At 2,740 pounds, broke ring in thimble end. Rope drew in ferrule end 1½" with this load. Rope in thimble not started perceptibly.

Under 3,420 pounds, rope drew from ferrule.

One end of rope now held in circular soft metal dies.

Under 5,450 pounds, the rope fractured two strands at the end of the thimble.

Both ends now held in circular soft metal (lead) dies.

Strength of the rope, 6,800 pounds.

Fractured one strand.

The strength of the rope as developed by the final test, thought to be too low on account of the previous fractures, and consequent uneven distribution of the load on the several strands.

SCOTCH GILL TWINE, No. 2 (LARGE), TESTED FOR CAPT. D. A. LYLE, FOR THE U. S. LIFE-SAVING SERVICE.

Total length of sample, 35 feet.

Composed of 3 strands of 19 threads each, laid one turn in about 2 inches.

Three tests made from the same piece of line.

Test number.	Tensile strength.	Elongation in 6 feet.	
		Inches.	Per cent.
	Pounds.		
939	520	4.50	6.2
940	512	4.50	6.2
941	484	3.50	4.9

No. 938.

TENSILE TEST OF A PIECE OF MAGNESIUM WIRE.

Length, 7."3.
Diameter, ."030. Sectional area, ".0007 square inch.
Tensile strength, 27 pounds=38,570 pounds per square inch.

TENSILE TESTS OF COTTON DUCKING FOR THE U. S. NAVY DEPARTMENT, BOSTON, MASS.

Strips about 20" long.
Eight inches between holder jaws.

Test number.	Marks.	Picks per inch.	Width of strip.	Tensile strength.
			Inches.	*Pounds.*
1327	Hammock, lengthwise	Warp, 29	1.17	292
1328	do	Filling, 17	1.17	251
1329	Hammock, crosswise		1.17	232
1330	do		1.08	219
1331	Bag, lengthwise	Warp, 36	1.15	204
1332	do	Filling, 21	1.10	205
1333	Bag, crosswise,		1.10	234
1334	do		1.10	225

PRIVATE TESTS.

Date.		Material.	For whom tested.		
			Name.	City.	State.
1886.					
July	13	12 steel plates	Norway Steel and Iron Co.	South Boston	Mass.
	22	4 granite cubes	Geo. D. Webb Granite Co	Fitzwilliam Depot	N. H.
	24	34 pieces fire-proof building material.	Pioneer Fireproof Const. Co	Chicago	Ill.
	27	30 pieces horse blankets	L. C. Chase & Co	Boston	Mass.
Aug.	17	1 pressed brick	J. C. Anderson	do	Do.
Sept.	17	1 piece wire rope	Whittier Machine Co	do	Do.
	18	11 bricks	J. C. Anderson	do	Do.
	18	4 bricks	A. V. Hugel	do	Do.
	18	3 bricks	Louis Promoli	do	Do.
	18	3 marble cubes	Georgia Marble Co	Atlanta	Ga.
Oct.	13	1 piece steel plate	H. S. Robinson	Boston	Mass.
	15	1 riveted joint	Philadelphia Water Dept	Philadelphia	Pa.
	15	2 turn-buckles	Rhode Island Tool Co	Providence	R. I.
	16	3 shackles	H. L. Fearing & Co	Boston	Mass.
Nov.	5	1 piece manganese steel	N. Washburn	Allston	Do.
	13	8 wrought-iron plates	A. H. Howland	Boston	Do.
	20	9 terra-cotta cubes	Boston Terra Cotta Co	do	Do.
	26	12 pieces steel plate	Channing Whittaker	Lowell	Do.
	27	2 pieces copper wire	De-Oxidized Metal Co	Bridgeport	Conn.
Dec.	14	1 piece steel plate	Linden Steel Co	Pittsburgh	Pa.
	15	2 pieces charcoal iron	Katahdin Charcoal Iron Co.	Bangor	Me.
	17	9 specimens terra-cotta lumber.	Kansas City Terra Cotta Lumber Co.	Kansas City	Mo.
1887.					
Jan.	21	1 eye-bar	H. F. Dunham	Cleveland	Ohio.
	25	2 granite cubes	Norcross Bros	Worcester	Mass.
	27	4 paving bricks	Hale Pavement Co	Boston	Do.
Feb.	7	3 cast-iron columns	Snead & Co. Iron Works	Louisville	Ky.
	9	1 brick pier	Fred. Pope	Boston	Mass.
Mar.	16	16 riveted joints	Pennsylvania R. R. Co	Altoona	Pa.
	17	3 pieces aluminum bronze	A. H. Cowles	Lockport	N. Y.
	25	3 pieces bronze	G. H. Bushnell & Co	Worcester	Mass.
Apr.	4	8 bars wrought iron	Dodge, Haley & Co	Boston	Do.
	15	3 bars cast iron	Golding & Co	do	Do.
	20	6 steel bars	Continental Works	Brooklyn	N. Y.
	27	5 pieces aluminum bronze	Cowles, E. S. & Al. Co	Cleveland	Ohio.
May	2	1 bar wrought iron	Wm.-M. Horne & Co	Boston	Mass.
	3	3 pieces aluminum bronze	Cowles, E. S. & Al. Co	Cleveland	Ohio.
	7	20 pieces steel plate	Whittier Machine Co	Boston	Mass.
	7	3 pieces wrought-iron plate	Boston Bridge Works	do	Do.
	7	1 piece steel plate	Rhode Island Loco. Works	Providence	R. I.
	24	3 bars cast iron	S. C. Rowell & Co	Boston	Mass.
	24	1 piece stone	Otis E. Bowen	Highlandville	Do.
	27	7 steel specimens	Midvale Steel Co	Philadelphia	Pa.
June	14	5 pieces steel plate	Whittier Machine Co	Roxbury	Mass.
	15	9 perforated plates	Rhode Island Loco. Works	Providence	R. I.
	30	1 piece steel wire rope	General E. W. Serrell	New York	N. Y.

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